TANK SYSTEMS REPORT

US ECOLOGY NEVADA

March 2010

Revised October 2011

SECTION 10

TANK SYSTEMS REPORT

TABLE OF CONTENTS

APPENDICES

MANAGEMENT OF HAZARDOUS WASTES IN TANKS

US Ecology – Beatty, Nevada (USEN) manages hazardous waste[1] in tanks in five different scenarios:

- Waste Stabilization / Treatment Units
- Polychlorinated Biphenyl (PCB) Tank Farm
- Evaporation Pad & Associated Tank
- Leachate Collection Tank(s)

Table 1 – Summary of Tank Management Units				
Tank	Common Name			Capacity [gallons]
	Common Name	Status	Permit Required	
#1	Stabilization Tank (Pan 1)	Existing	Yes	6,400
#2	Stabilization Tank (Pan 2)	Existing	Yes	35,500
#3	Stabilization Tank (Pan 3)	Existing	Yes	35,500
#4	PCB Storage & Treatment Tank	Existing	Yes	7,500
#5	PCB Storage & Treatment Tank	Existing	Yes	7,500
#6	PCB Storage & Treatment Tank	Existing	Yes	5,000
#7	PCB Storage & Treatment Tank	Existing	Yes	5,000
#8	PCB Storage & Treatment Tank	Existing	Yes	3,000
#9	PCB Storage & Treatment Tank	Future	Yes	12,500
#10	PCB Storage & Treatment Tank	Future	Yes	12,500
#11	Evaporation Tank	Existing	Yes	10,000
#15	Leachate Storage Tank	Existing	Yes	10,000
#18	Stabilization Tank (Pan 4)	Existing	Yes	17,250
#19	Stabilization Tank (Pan 5)	Existing	Yes	17,250

10.1.0 STABILIZATION TANKS

10.1.1 Process Description

USEN operates five stabilization tanks to solidify wastes containing free liquids, transfer wastes between containers, and to treat hazardous waste debris to comply with LDR standards or alternative treatment methods.

Stabilization Tanks 1-3 are capable of processing 75 tons/hour of waste and Tanks 4 and 5 are capable of processing 50 tons/hour. An excavator, backhoe, rotary mixing head, front-end loader, and/or other equipment may be used as mixing tools. Potential air emissions are minimized with the use of water sprays and/or fog systems.

10.1.1.1 Debris Treatment

Hazardous debris is treated by microencapsulation and macroencapsulation as discussed in the Section 11 Landfill Report and the Section 8 Waste Analysis Plan. Microencapsulation may be completed within stabilization tanks.

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1 Here-in-after "waste" or "wastes."

10.1.1.2 Waste Stabilization Activities

Five (5) existing tanks stabilize wastes by mixing waste and stabilization reagents. A design drawing for the stabilization vessels is provided in the integrity assessment included in Appendix E.

Reagent selection is typically determined from the stabilization recipe developed in the laboratory, scaled up to the net weight of the load. In those cases where recipes are not predetermined, [2] the treated waste is tested to ensure the appropriate treatment standard or method is achieved.

Once the operator determines the waste and reagents have been adequately mixed, the stabilized material is typically taken to the active cell for disposal, containerized and placed in the Dry Hazardous Waste Storage Area, or, as an alternative, staged in a segregated portion of the active landfill while being analyzed, but before being disposed.

Conformational testing is conducted on treated waste to verify compliance with applicable LDR treatment standards. As described in the WAP, samples are collected from treated waste streams to confirm the waste meets applicable LDR standards. Absence of free liquids is also confirmed on each treated waste stream using a visual inspection and/or the Paint Filter Liquids Test (PFLT), if the presence of free liquids is in question.

10.1.2 Tank Installation Certification

Appendix E contains integrity assessments certified by an independent professional engineer, registered in the State of Nevada, on the structural integrity of the stabilization tank systems and their suitability to manage the hazardous wastes intended. USEN also inspected the stabilization tanks prior to placing them in service to ensure proper installation.

10.1.3 Diagram of Piping, Instrumentation and Process Flow

Operation of the batch stabilization vessels does not require piping or instrumentation as these are batch-operated units.

10.1.4 Description of Secondary Containment Structure

The waste stabilization units are double-walled steel tanks. Two (2) of the tanks (Stabilization Tanks #2 & #3) are adjacent to each other, another tank (Stabilization Tank #1) is located in a near-by, but separate location. Two stabilization tanks 4 and 5 (Tanks 18 and 19) are located inside the Container Management Building. The primary tank holds the waste materials and the external secondary tank serves as a secondary containment system. Each secondary tank slopes to a collection sump. In addition, a steel pan covered with 12" of sacrificial soil is provided around the outdoor units. This secondary containment

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[2] As can be the case for commonly treated materials such as lead contaminated wastes.

device drains into the stabilization tanks and is surrounded by a concrete curb to prevent run-on and run-off. A tertiary, high-density, polyethylene (HDPE) liner is located under Stabilization Tank #1 and serves as further protection. Stabilization pan 4 and 5, located inside the Container Management Building, are surrounded by a concrete floor system to contain wastes managed around the tanks.

10.1.5 Preventing Spills and Overflows

Trained facility personnel oversee loading, unloading and treatment activities to ensure operations minimize spillage of waste outside the treatment units or containment systems. The outdoor units are equipped with a steel secondary containment pan covered with sacrificial soil to contain spillage. Spillage is promptly removed and placed in the treatment tanks or otherwise managed in accordance with the WAP. Pans 4 and 5 are surrounded by a concrete floor system. Waste spilled in the area can be washed into the pan system for management.

The quantity of waste in the vessel is limited to minimize spillage during mixing. Spillage or residue is contained within the containment structure and returned to the mixing vessel or managed in accordance with the WAP.

10.2.0 PCB STORAGE & TREATMENT TANKS

The tank processing system consists of the PCB Building, where storage, handling, draining and flushing of transformers and capacitors take place, and four (4) carbon steel tanks located outside the building for the temporary storage of drained liquid PCBs, rinsate, and other organic wastes until transported off-site. These tanks are to be used for TSCA regulated PCB contaminated liquids only.

10.2.1 Tank Description

The PCB treatment & storage tanks have a combined capacity of 25,000 gallons, consisting of two (2) 7,500-gallon tanks (Tanks #4 & #5), and two (2) 5,000-gallon tanks (Tanks #6 & #7). A 3,000-gallon tank (Tank #8) is used to transfer liquids from the original containers to the storage tanks. The 5,000-gallon tanks are 8' in diameter and 14' in length with four (4) supports, while the 7,500-gallon tanks are 8' in diameter and 20' long with six (6) supports. All tanks are carbon steel, with a nominal ¼" shell thickness.

No internal corrosion protection measures are necessary for the tanks, since carbon steel is not subject to corrosion by PCB oil, transformer flush fluid, or other organic wastes.

The PCB storage tanks (Tanks #4 - #7) are vented through a carbon filtration system. The filtration system consists of 2 carbon canisters in series and connects to the storage tanks vents. When PCB liquids are being transferred to the storage tanks the air/vapors are pulled through the filtration system to prevent PCBs from possibly entering the atmosphere. Pictures of the system are included in Appendix G.

10.2.2 Tanks System Integrity Assessment

In accordance with 40 CFR §264.191, tank integrity assessments are required on tank systems in existence as of July 14, 1986, if the system is not provided with secondary containment. Since this tank system is an existing system with secondary containment, no integrity assessment is provided for this unit. Ultrasound testing of the tanks will be conducted annually as a precautionary measure and reported in the Annual Report. These tests demonstrate that tank shell thickness exceeds the recommended minimum for horizontal carbon steel tanks. Results of the leak test, and an excerpt from UL 142 "Steel Aboveground Tanks for Flammable and Combustible Liquids" illustrating shell thickness requirements, are included in Appendix F.

10.2.3 Description of Feed Systems and Safety Cut-Off Systems

An automatic or emergency cut-off system is not required since the pumping of PCB liquid and other organic wastes is conducted as a batch operation rather than as continuous flow. The storage tanks are provided with overfill control equipment consisting of high-level alarms audible inside the PCB Building, which alert the operator when the tank level is approaching maximum capacity. Tank T-8, vacuum tank is not equipped with an alarm because PCBs are not stored in this tank. It is simply used as a transfer tank.

10.2.4 Diagram of Piping, Instrumentation, and Process Flow

Appendix G contains a diagram illustrating the piping; instrumentation and process flow for this system, and design drawings for each tank.

10.2.5 Containment and Detection of Releases

The storage tanks are located within a bermed containment area, elevated to allow leak detection during daily inspections. The containment area is underlain by an external liner system consisting of two (2) 30-mil liners protected by a polyester 125-mil filter fabric and 1-3" of sand. Drawings are included in Appendix H illustrate the configuration of the liner system.

Appendix I includes calculations demonstrating the ability of the system to contain twice the volume of the largest tank capacity (7,500 gallons), in addition to precipitation resulting from a 100-year, 24-hour storm event.

The liner system provides protection from vertical and lateral migration of waste as it surrounds the tank farm and covers all surrounding soil likely to be in contact with the waste in the event of a release. The 1-3" layer of sand covering the liner system serves as a containment media for a potential release. Because of the viscous nature of the PCB oils, the migration of any potential release from the storage tanks would be a slow process, allowing pumping of a great portion before seepage through the containment media occurs. Any spillage or contaminated portion of the containment media will be removed within 24 hours, or as soon as practicable, and the containment layer restored to its original thickness with clean sand.

10.2.6 Description of Practices to Prevent Spills and Overflows

Trained facility personnel oversee loading, unloading and treatment activities to minimize spillage of waste outside the treatment units or containment systems. Spillage is promptly removed and managed in accordance with the WAP.

10.3.0 EVAPORATION TANK

An Evaporation Tank (Tank #11) manages aqueous wastes (e.g.; wash water generated from vehicle decontamination, laboratory wastewaters, collected liquids from containment systems, and off-site generated wastes, etc.). The tank is 10,000 gallons and is provided with a pump and piping system that recirculates the water to break the liquid's surface tension and accelerate the evaporation process.

10.3.1 Evaporation Pad Description

The evaporation pad was constructed as a monolithic reinforced concrete unit, designed to resist cracking. The unit's bottom and walls are coated with a waterproofing coating.

Appendix A contains the design drawings for the evaporation pad. Volume calculations illustrating the net capacity of the tank are included as Appendix B. The unit's net volume accounts for the containment required for a 100-year, 24-hour storm event, and maintenance of a 6" freeboard at all times.

10.3.2 Tank Integrity Assessment

Appendix C contains a written assessment certified by an independent, qualified, professional engineer, on the structural integrity of the unit and its suitability to handle the hazardous wastes placed in the unit and the certification report on the quality assurance observed during unit installation.

10.3.3 Description of Feed and Cut-Off Systems

The evaporation tank is not equipped with any feed and cut-off systems. The unit receives wastes from several sources which are placed in the unit on a batch process.

10.3.4 Diagram of Piping and Process Flow

As described above, no piping or instrumentation is associated with the unit's waste feed mechanisms.

10.3.5 Description of Secondary Containment Structure

The evaporation tank is equipped with a liner and leak detection system consisting of a 4-millimeter-thick vapor barrier, followed by open graded sand underlain by a 40-millimeter, high-density polyethylene (HDPE) flexible membrane. The HDPE membrane covers the full height of the tank walls (up to the freeboard), and is sealed at the edges to prevent rainfall from entering the system.

The design of the evaporation pad secondary containment system satisfies the 40 CFR §264.193(d)(3) description of a doubled-walled tank, where the HDPE flexible membrane functions as the outer shell capable of containing any release from the inner tank. The system is equipped with an 8" steel pipe riser, which is inspected daily to allow detection of a release within 24 hours, or at the earliest practicable time.

10.3.6 Description of Practices to Prevent Spills and Overflows

Trained facility personnel oversee loading, unloading and treatment activities to minimize spillage of waste outside the treatment units or containment systems. Spillage is promptly removed and managed in accordance with the WAP.

Daily inspection of the pad ensures that a minimum 6" freeboard is maintained in the tank to prevent overtopping due to wind action

10.5.0 LEACHATE STORAGE TANK

10.5.1 Storage Tank Description

The leachate storage tank is a ten thousand (10,000) gallon fiberglass reinforced tank. The tank is currently managed as a <90-day storage unit. Collected leachate is stored in the tank pending treatment and/or disposal.

10.5.2 Tank System Integrity Assessment and Installation Certification

An integrity assessment report, reviewed and certified by an independent professional engineer registered in the State of Nevada is included as Appendix K.

10.5.3 Description of Feed and Safety Cut-off System

An automatic or emergency cut-off system is not required since the pumping of liquid is conducted as a batch operation rather than as continuous flow. The leachate level in the storage tank is visually inspected daily to ensure the tank is not nearing maximum capacity. The employee performing the inspection will compare leachate levels in the tank with a painted red line that indicates the high level mark. When the leachate level reaches the indicator mark no more liquid can be added to the tank.

10.5.4 Diagram of Piping, Instrumentation, and Process Flow

The tank integrity assessment and installation certification report included in Appendix K includes a diagram illustrating the piping; instrumentation and process flow for this tank system.

10.5.5 Containment and Detection of Releases

The storage tank is contained within a fiberglass reinforced secondary containment vessel. Daily inspections will detect any release from the tank to the secondary containment vessel. Any spillage is removed within 24 hours (or as soon as practicable).

10.5.6 Description of Practices to Prevent Spills and Overflows

Trained facility personnel oversee loading, unloading and treatment activities to minimize spillage of waste outside the treatment units or containment systems. Any spillage is promptly removed and managed in accordance with the WAP.

This is a manually operated tank not requiring any high level alarm.

10.6.0 SUBPART AA, BB AND CC STANDARDS

10.6.1 Subpart AA

The requirements of 40 CFR Part 264, Subpart AA are not applicable to the tanks discussed.

10.6.2 Subpart BB

The requirements of 40 CFR Part 264, Subpart BB are not applicable to the tanks discussed with the exception of Tanks T-4 through T-8 (PCB storage tanks). To comply with Subpart BB each piece of equipment has been identified and tagged with a unique number. Appendix G contains detailed schematics of this system. Per 40 CFR §264.1063 USEN will perform monthly Method 21 inspections using a portable Photo Ionization Detector (PID) to verify no equipment leaks. Any leaks detected will be fixed immediately and documented.

10.6.3 Subpart CC

The requirements of 40 CFR Part 264, Subpart CC are not applicable to the tanks discussed. The Subpart CC Air Emission Standards for the five stabilizations tanks (T-1, T-2, T-3, T-18, and T-19) will not apply because USEN will not accept for treatment hazardous waste with volatile organic compounds (VOC) concentrations greater than 500 ppm. All generator profiles are reviewed by USEN technical staff to ensure VOCs are below these limits. The five PCB storage tanks (T-4 through T-8) will not be subject to the Subpart CC regulations because concentrations of VOCs will not be greater than 500 ppm.

10.7.0 MANAGING INCOMPATIBLE, IGNITABLE OR REACTIVE WASTES

In accordance with the requirements of 40 CFR §264.17, USEN has developed a program to ensure that necessary precautions are taken to prevent the accidental commingling or reaction of incompatible and/or reactive wastes, or ignition of ignitable materials. The program encompasses the following elements:

- Identification of the hazardous characteristics of the waste streams during the approval process as described in the WAP;
- Segregation of reactive or incompatible materials according to USEN's segregation and classification system;
- Identification of the potential for incompatible reactions through the waste stream verification program described in the WAP. Verification testing of incoming shipments includes water reactivity tests and compatibility checks on waste streams intended for bulking or combined treatment. When the potential for inadvertent reactions is anticipated, precautions are taken as appropriate; and
- Identification of sources of ignition and necessary precautions.

10.7.1 Precautions for the Management of Incompatible Materials

Conducting compatibility testing between any loads intended for simultaneous treatment prevents inadvertent reactions in the batch stabilization units. No waste will be added to the treatment unit until all potentially incompatible waste or residues have been removed to the maximum extent possible.

Where the potential for incompatibility exists, USEN documents in the operating record the precautions observed to prevent violent reactions and/or generation of extreme heat, toxic mists, fumes or gases. Such documentation may consist of waste analysis results, results of compatibility tests, or the results from management of similar wastes under similar operating conditions.

10.7.2 Precautions for Management of Ignitable or Reactive Wastes

Ignitable or reactive wastes will only be placed in the tank system such that the waste is treated, rendered, or mixed before or immediately after placement in the tank so that:

- the resulting waste, mixture, or dissolved material no longer meets the definition of ignitable or reactive waste under 40 CFR §§261.21 or 261.23, and
- the waste is separated and protected from sources of ignition or reaction including but not limited to: open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. While ignitable or reactive waste is being handled, smoking and open flames will be confined to specially designated locations. "No Smoking" signs are conspicuously placed wherever there is a hazard from ignitable or reactive waste; or
- the waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react.

10.8.0 RESPONSE TO LEAKS OR SPILLS AND DISPOSITION OF UNFIT TANKS

The tank system or secondary containment system from which there has been a leak or spill, or that becomes unfit for use, will be removed from service. USEN will stop the flow of hazardous waste into the system and inspect it to determine the cause of the release. All material will be removed from the tank and associated secondary containment within 24 hours of becoming aware of the situation, or at the earliest practicable time, if removal is not possible within 24 hours. Since all hazardous waste tanks at the facility are provided with secondary containment, no release to the environment is anticipated. However, in the unlikely event of such a release, USEN will visually assess the extent of the release, and based on that assessment, determine the measures necessary to prevent further migration of the leak or spill to soils or surface water. Any visible contamination will be promptly removed and properly managed.

Notification of a reportable release will be provided to the NvDEP Administrator within 24 hours of detection. No notification will be provided if the release involves a waste quantity of one (1) pound or less, and it is immediately contained and cleaned up. Within 30 days of detection of the release to the environment, USEN will submit to the Administrator a written report containing the following information:

- Likely route of migration of the waste;
- Characteristics of the surrounding soil (soil composition, geology, hydrogeology, climate, etc.);
- Results of any monitoring or sampling conducted in connection with the release (if available);
- Proximity to down-gradient drinking water, surface water, and populated areas; and
- Descriptions of response actions taken or planned.

If the cause of the release was a spill that did not damage the containment system's integrity, the system will be returned to service once the released waste is removed and all necessary repairs are made. If major repairs of the tank system are required (e.g., installation of an internal liner, repair of a ruptured[4] primary or secondary containment structure), a certification by an independent, qualified, registered, professional engineer will be obtained indicating that the repaired system is capable of handling hazardous waste without a release for the rest of the unit's service life. This certification will be obtained prior to returning the system to service, and will be submitted to the NDEP Administrator within seven (7) days of returning the system to use.

If the system cannot be repaired, the tank system will be closed according to procedures described in the approved Closure Plan.

10.9.0 INSPECTION OF TANKS AND COMPLIANCE WITH 40 CFR §264.194 AND §264.195

Treatment and storage tanks are inspected in accordance with the Section 5 Inspection Plan. All tanks will be inspected at least once per operating day with any deficiencies reported directly to the Facility Manage or designee. The following (if applicable) will be inspected:

- Overfill/spill control equipment to ensure it is in good working order
- Above ground portions of the tank system to detect corrosion or releases of waste
- The construction materials and the area immediately surrounding the externally accessible porting of the tank system, including secondary containment.
- The level of waste in the tank to ensure adequate freeboard
- On a bi-monthly basis, the cathodic protection on Tanks 1, 2, and 3 will be inspected

All daily tank inspections will be turned into the Compliance Department and maintained as part of the facility operating record.

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4 Ruptures do not include breaks in welds or in the tank shell due to normal wear & tear. Most tank repair events at USEN are due to excavator wear on the steel surface of the tank & are not "ruptures" as that term is used in 40 CFR §264.196 nor are the repairs typically "major tank repairs."

10.10.0 CLOSURE OF TANKS[5]

At closure, all hazardous waste and hazardous waste residue will be removed from the tanks or tank systems described in this section, treated and / or disposed of in the landfill, or sent to an off-site facility for treatment and / or disposal. All tank systems, including tank vessels, piping, ancillary equipment and contaminant structures will either be removed and properly managed (e.g.; disposed of in the on-site landfill), or decontaminated in accordance with procedures described in the Closure Plan.

10.11.0 ONE YEAR STORAGE

Waste placed in a tank is not to exceed 1 year from the date of receipt. At a minimum frequency of once per month USEN will perform an inventory of waste being stored in tanks. Reports generated by AESOP (or NEWTON once released) will be utilized to ensure all received wastes are disposed of within 1 year of receipt.

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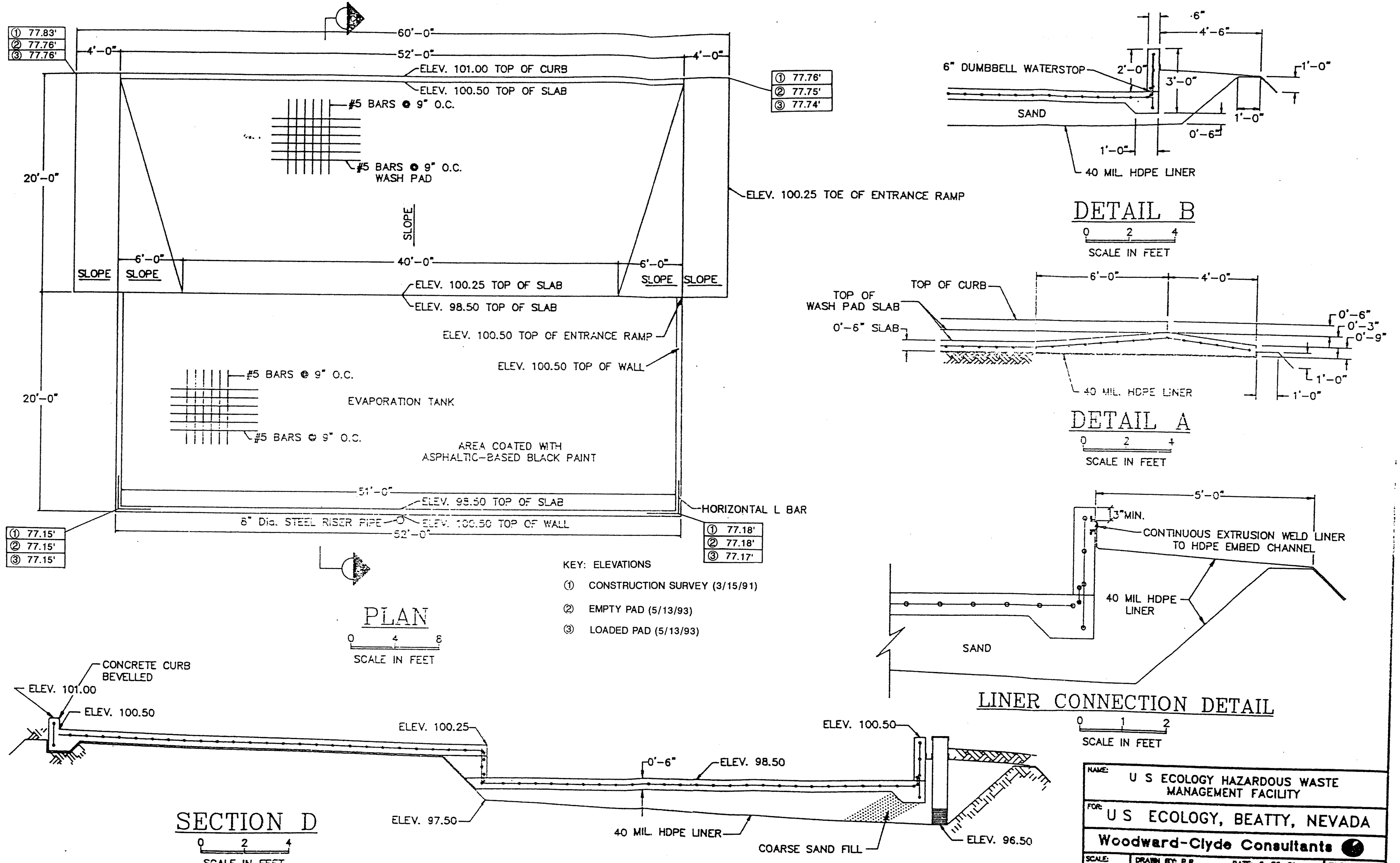
[5] The Closure Plan governs any discrepancy between the general description of closure activities and this section since it is the authoritative document on closure issues.

APPENDIX A

EVAPORATION PAD DESIGN DRAWINGS



NAME: U S ECOLOGY HAZARDOUS WASTE MANAGEMENT FACILITY			
FOR: U S ECOLOGY, BEATTY, NEVADA			
Woodward-Clyde Consultants			
SCALE: NOTED	DRAWN BY: P.R. CHECKED BY:	DATE: 6-26-91 DATE:	FILE NO. 90H3121C
CONCRETE WASHPAD			FIGURE

APPENDIX B

EVAPORATION PAD VOLUME CALCULATIONS

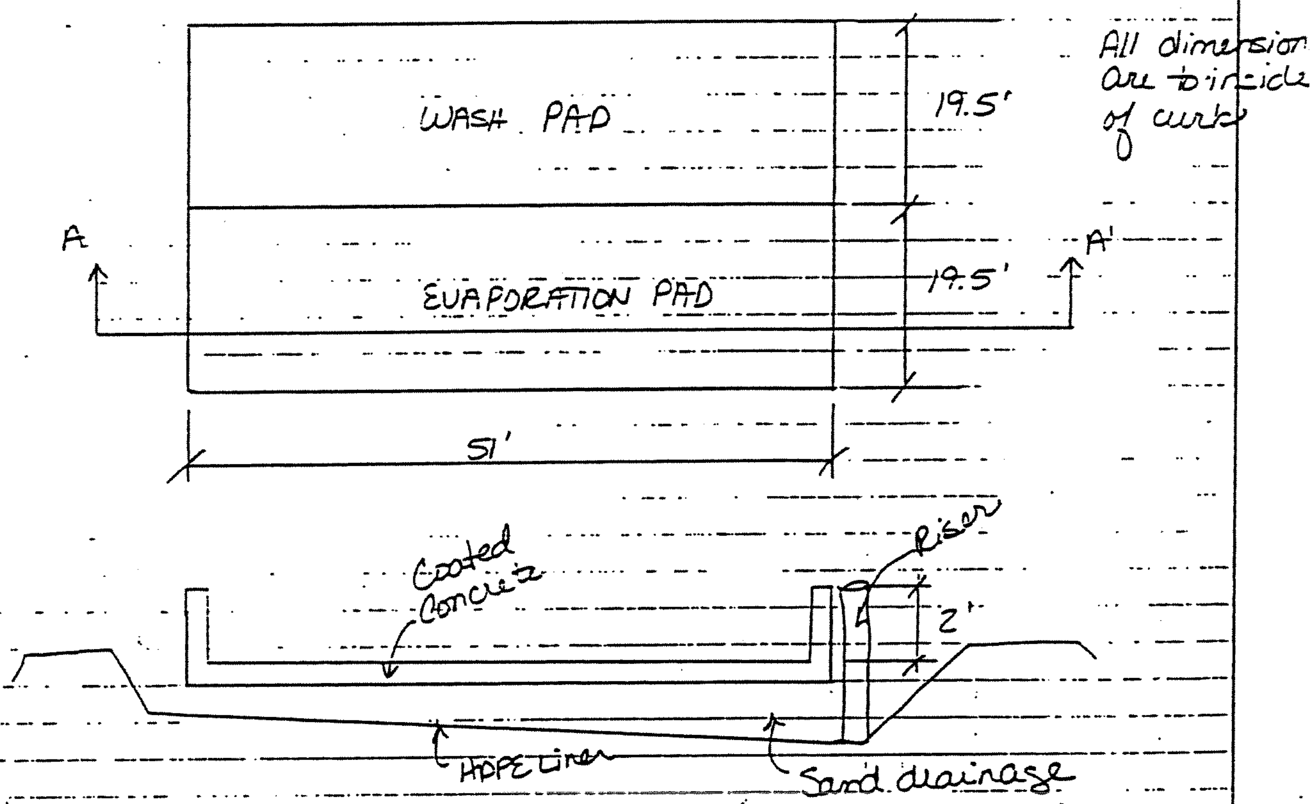
American Ecology

SHEET NO. 1 OF 1
CALC. NO. NV148 - 040
DATE 6/27/95
COMPUTED BY [signature]
CHECKED BY [signature]
REV 1 REV 2 REV 3

PROJECT: BEATTY PERMIT RENEWAL
SUBJECT: EVAPORATION PAD VOLUME CALCULATIONS

Calculate the volume of the evaporation pad.

Dimensions of pad are (Ref. Dwg. NV-105-CON-001 in Appendix B of Section IVC, Tank System Report of Permit renewal application)



Section A-A' (Typ.)

Gross Vol. of evaporation pad = (51')(19.5')(2') = 1989 ft^3

1989 ft^3 $\left(\frac{7.48 \text{ gal}}{\text{ft}^3}\right)$ = 14,878 gal

Allowing for rainfall and freeboard
25 yr., 24 hr. storm = 2.0 in (Precipitation-Frequency Atlas of the Western U.S., Vol. VII - Nevada)
Effective depth for waste liquids = 1.33'
Effective Vol. for waste liquids = (51')(19.5')(1.33') = 1323 ft^3
1323 ft^3 (7.48 gal/ft^3) = 9896 gal.

APPENDIX C

EVAPORATION PAD CONSTRUCTION QUALITY

ASSURANCE AND INTEGRITY ASSESSMENT REPORTS

APPENDIX C

EVAPORATION PAD CONSTRUCTION QUALITY

ASSURANCE AND INTEGRITY ASSESSMENT REPORTS

Houston, Texas 77055
(713) 688-9111
Telecopy (713) 688-6253

June 14, 1991

U S Ecology, Inc.
9200 Shelbyville Road, Suite 300
P.O. Box 7246
Louisville, Kentucky 40257-0246

Attention: Mr. Howard Althouse
Project Engineer

Subject: Construction Quality Assurance Services For:
Reinforced Concrete Washpad U S Ecology's
Hazardous Waste Management Facility
Beatty, Nevada
WCC File: 90H3121C

Dear Mr. Althouse:

This report summarizes the quality assurance monitoring services provided by Woodward-Clyde Consultants for the construction of a reinforced concrete washpad at the U S Ecology's Hazardous Waste Management Facility near Beatty, Nevada.

The report summarizes the monitoring activities and includes the conclusion of these activities.

Should you have any questions or if we can be of further service, please do not hesitate to contact us.

Sincerely,

Don. L. Colbourne
Project Manager

DLC:llm

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coarse sandfill leak detection layer on top of the HDPE liner under the area defined as the evaporation tank; and the construction of the reinforced concrete structure. Following the completion of the concrete structure the HDPE liner was carried up and mechanically fastened to the top of the outside perimeter of the concrete structure.

1.3 SCOPE OF WORK

WCC was retained by US Ecology to implement the CQA program for the construction of the washpad. WCC's services included the observation and documentation of construction activities including the preparation of the subbase, placement of the HDPE liner, coarse sandfill and reinforced concrete. WCC observed the field testing of the concrete by ETEC Testing Laboratory, Inc. (ETEC) of Las Vegas, Nevada. The off-site concrete testing was carried out by ETEC. WCC observed the HDPE liner Contractor's testing of the HDPE liner site seams. WCC reviewed the Contractors' quality control test results and provided on-site records management and system control.

The services provided by WCC were performed in accordance with our contract and the documentation provided by US Ecology, which included the following:

- Bid documents which included:
  - Request for Proposal letter dated November 13, 1990
  - Specification No. 167-C-001, Pages 1-13, For Structural Concrete US Ecology, November 16, 1990, Revision 0
  - Specification No. 140-C-001, Pages 1-79, US Ecology, October 23, 1990, Revision 5 (for HDPE liner reference)
  - Plan Sheet No. NV-105-CON-001, U.S. Ecology, November 3, 1991, Revision 1

1.4 PROJECT TEAM ORGANIZATION

The project team consisted of the following firms and individuals:

Entity/Individuals	Position
• US Ecology, Inc. Louisville, Kentucky	- Owner and Designer
- H. Althouse, P.E. - D. Adrian	- Project Engineer - Project Manager
• US Ecology, Inc. Beatty, Nevada	
- R. Marchand - W. Marchand	- Site Superintendent - Construction Foreman
• Woodward-Clyde Consultants Houston, Texas Oakland, California	- Construction Quality Assurance
- Don L. Colbourne - H. Richard Soennichsen, P.E. - Scott Davis - Bill Snyder	- Project Manager - Project Certifying Engineer - CQA Site Manager - Senior Technician Soils/Geosynthetics
• T & J Concrete Beatty, Nevada	- Concrete Contractor
- Tom Nickell	- Superintendent
• Poly-America, Inc. Dallas, Texas	- Geomembrane Installation
- M. Jett - C. Piper	- Sales Manager - Site Superintendent

Entity/Individuals		Position
• National Seal Company Palatine, Illinois	-	Geomembrane Manufacturer
• ETEC Testing Laboratories Las Vegas, Nevada	-	Concrete/Testing

1.5 CHRONOLOGY OF CONSTRUCTION

WCC's CQA manager arrived on site December 11, 1990. The preparation of the subbase was ready for the placement of the 40 mil HDPE liner December 12, 1990 and the construction activities were generally completed in the following sequence:

- December 17, 1990 placement of HDPE liner.
- December 21, 1990 placement of sand on top of HDPE liner as part of leak detection system. Placement of reinforcing steel and concrete form work in process.
- January 8, 1991 completion of concrete placement.
- January 18, 1991 hydrostatic testing of washpad and leak repairs; completion of attaching HDPE liner to outside perimeter of washpad.
- The surface of the concrete was coated while WCC's representative was not on site. The coating application was observed by WCC's representative upon return to the site. The evaporation tank area was coated with a two-component coating (Hi-Build Tneme Tar) manufactured by Tnemec Protective Coating of Kansas City, Missouri; the wash area was coated with a two-component coating (UI 7012) manufactured by Urethane Plastics, Inc. of Placentia, California.

1.6 CONSTRUCTION QUALITY ASSURANCE

The documentation provided by US Ecology for: a) Specification for Structural Concrete and b) Specification for Trench 11 provided the initial guidelines for the CQA procedures necessary to evaluate, with a reasonable degree of certainty, that the completed facility meets the design criteria through the contractors' conformance to the approved Design Drawings and Specifications. In addition a CQA Plan was submitted by WCC to US Ecology.

The CQA elements outlined in the Specifications and CQA Plan include: (1) defining the responsibility and authority of all organizations and key personnel involved, (2) presenting the qualifications of CQA personnel and construction Contractors, (3) summarizing the observation and testing activities to be used to monitor the construction and, (4) describing the documentation to be performed, collected and stored. Documentation summarizing the CQA monitoring activities are presented in the following appendices.

Appendix A: Preconstruction Meeting
Appendix B: Improvements/Adjustments
Appendix C: Woodward-Clyde Consultants' Reports
- C1 - Daily Reports
- C2 - Summary of Site Activities

Appendix D: Concrete Testing
Appendix E: Geomembrane Installation
- E1 - Contractor's Documentation
  - Daily Reports
  - Subgrade Acceptance
  - HDPE Welding Rod QC Report
- E2 - Woodward-Clyde Consultants' Site Documentation
  - Panel Placement Log
  - Trial Seam Log
  - Seaming Log

Appendix F: Record Drawing

1.7 CONSTRUCTION MEETINGS

A preconstruction meeting was held December 11, 1990 at US Ecology's, Beatty, Nevada site. The meeting was held to review the requirements for the construction of three projects which included the washpad. Minutes of the preconstruction meeting are presented in Appendix A. As a result of the limited construction activities formal daily/weekly meetings were not held, normal daily on-site discussions took place for review of progress and construction activities. Points discussed are noted in the CQA Site Manager's daily reports (Appendix C1). The progress of construction is outlined in the CQA Site Managers' weekly report (Appendix C2).

1.8 FIELD IMPROVEMENTS/ADJUSTMENTS

All design field improvements/adjustments were approved by US Ecology's Project Engineer. The improvements/adjustments are as follows:

- The mechanical connection of the HDPE liner to the outside perimeter of the washpad was replaced with Poly-America's product Poly-Lock, which is designed specifically for this task.

- A 6-inch waterstop was used in place of the minimum 4-inch waterstop specified. The latter product was not available.

- The 40 mil HDPE liner used was manufactured by the National Seal Company. This liner had been inventoried on site following the completion of an earlier project. Quality Control documentation for this liner was included in the Certification Report for the 1988 Trench 11 project. This documentation is not included in this report.

- The test results of the concrete indicated that the concrete strength did not meet the compressive strength of 4,000 psi required in the specification. The tests results indicated concrete strength of approximately 3,500 psi. Consideration was given to the specification requirements, set deliberately high to avoid unacceptably weak concrete, the use of reinforcing steel bars and the fact that washpads with concrete having similar compressive strengths as the new washpad had shown no structural weaknesses during use and no structural weaknesses were observed, by US Ecology, when the old washpad was demolished. As a result of these observations, the new washpad was approved. Documentation relating to the concrete laboratory testing is presented in Appendix D "Concrete Testing."

- The slopes of the concrete slab and ramps, in the equipment cleaning area, were adjusted to prevent low trailers and trucks from impacting the concrete as they entered and exited the area, as had been experienced with prior washpads.

- The concrete curb ends were beveled to avoid contact with (damaging) equipment tires.

Documentation outlining these improvements is presented in Appendix B "Improvements/Adjustments," and Appendix A "Preconstruction Meeting."

2.0
CONCLUSION

The services reported herein have been performed by WCC within the scope presented in the US Ecology's Quality Assurance requirements and in accordance with the current standards of practice and standard of care for the profession ordinarily exercised by other professions under similar circumstances.

Our conclusions are based upon observations performed at various locations and at specific times during the course of the work.

Test and sample locations were spaced in an attempt to obtain a representative measure of the in-place characteristics of each component of construction.

WCC's Quality Assurance monitoring of the construction of the washpad included visual observation of the work, observing collection of samples, laboratory testing of concrete and observation of field testing. The concrete laboratory and field testing were performed by ETEC Testing Laboratory to compare results with the approved Design Drawings and Specifications. In our opinion, WCC's CQA monitoring, confirmation of record drawing configurations and the results of the performance testing, indicate that the washpad was constructed in substantial conformance with the intent of the Design Drawings, Specifications and Quality Assurance requirements for this project.

The Professional Engineer's certification below represents a declaration of his professional judgment. Also, it should be understood that WCC's observations and monitoring of the work of other parties on a project shall not relieve such other parties from their responsibility for performing their work in accordance with applicable plans, specifications and safety requirements.

Don L. Colbourne
Project Manager

H.R. Soennichsen, P.E.
Project Certifying Engineer

REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA
H. RICHARD
SOENNICHSEN
CIVIL
No. 4901

Experation Date 6/30/92

\dlc\7172-2 [90H3121C]

APPENDIX A

PRECONSTRUCTION MEETING

88103909

Woodward-Clyde Consultants

PROJECT NAME: Beatty NV.

PROJECT NO.: 90H312IC

CLIENT: U.S. Ecology

DATE 1-18-91

WEATHER	Snow	Clear AM	Bright Sun	Overcast	Fog	Rain
TEMP.	To 32	32–50 AM	50–70	70–85	85–90	90–
WIND	Still		Moder 1	High	Report No. 29	
HUMIDITY	Dry X		Moder	Humid		

DAILY REPORT

0700 - @ site Poly America on site

0730 - P.A. performs tone welds on Ext.

0800 - Pre welds pass Detail work Begins on Trench 10 CAP - P.A. Attaching Geomembrane to Poly Lock @ wash pad - U.S. Ecology filling Evap. tank with water for Hydrostatic testing Leaks have Developed. Leaks will Be Grouted to stop Leakage.

0900 - P.A. offloads Geotextile fabric No Damage was observed

1200 - Lunch -

1300 - P.A. Continues to attach Liner to Poly Lock @ wash pad. P.A has completed Detail work on Trench 10 cap. Deployment of Geotextile Begins -

1500 - U.S. Ecology Grouting Leaks in Evap tank @ wash pad. P.A. Continues to Deploy Geotextile then Continuously Sewing Seams - 32 oz Soft fabric.

1700 - Exit site - Scott Davis W.C.C. - C. Piper 3 techs - 2 Labor Poly America.

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88103909

Woodward-Clyde Consultants

PROJECT NAME: Beatty, NV.

PROJECT NO.: 904312IC - Trench 10

CLIENT: U.S. Ecology

DATE: 1-17-91

WEATHER	Snow	Clear AM/PM	Bright Sun	Overcast	Fog	Rain
TEMP.	To 32	32-50 AM	50-70 PM	70-85	85-100	100+
WIND	Still		Moder	High	Report No. 28	
HUMIDITY	Dry	X	Moder	Humid		

DAILY REPORT

0700 - @ site Poly America on site -

0800 - P.A. performing pre welds on Equip. U.S. Ecology putting soil on completed Geosynthetics in an 18" loose lift then compacting with Vibratory Drum Roller making 8+ passes - No damage was se[en]

0830 - Pre welds pass P.A. begins detail work and final tie in seaming.

1200 - Lunch -

1300 - 3 Destructive Seam Samples Received for testing

1400 - Destructive Samples pass -

1500 - U.S. Ecology continues to place soil on completed Geosynthetics in 18" loose lift then compacting with Vibratory Drum Roller making 8+ passes No dama[ge] was observed. P.A. attaching Geomembrane to Polylock @ washpad - others continue detail wor[k] on Trench 10 Geosynthetic QAP -

1700 Exit site Scott Davis W.C.C. - C. Piper, 3 techs 2 Laborers Poly America -

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Woodward-Clyde Consultants

PROJECT NAME: Beatty NV.

PROJECT NO.: 9043R1C - Trench 10

CLIENT: U.S. Ecology

DATE: 1-16-91

DAY	AM / PM	S	M	T	W X	Th	F
WEATHER	Snow	Clear AM	Little Sun	Overcast	Fog	Rain
TEMP.	To 32	32-50 AM	50-70	70-85	85-90	90-
WIND	Still		Moder	High X	Report No.
HUMIDITY	Dry X		Moder	Humid	27

DAILY REPORT

0700 - @ site - PA on site

0730 - P.A. Performing Pre weld tests - U.S. Ecology filling Evap tank @ wash pad for hydrostatic test.

0830 - Pre welds pass Detail work & seaming begins. P.A. Deploying Geomembrane.

0900 - Evap tank @ wash pad developed leak @ water stop T&J will grout leak.

1200 - lunch

1230 - P.A. Performing pre welds

1300 - Pre welds pass - Detail & seaming begins - P.A. Deploys

1330 ~~last~~ panel #36 at trench 10 cap -

1400 - 3 Destructive seam samples marked on completed seams

1530 - Destructive seams samples received for testing.

1650 - Destructive testing complete All samples pass

1700 - Exit site - 15,825 sq ft Geomembrane installed - Scott

W.C.C. - Cooper, 3 techs - 5 laborers Poly America

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Woodward-Clyde Consultants

PROJECT NAME: Beatty NV.

PROJECT NO.: 90H3121C Trench 10

CLIENT: U.S. Ecology

DATE 1-11-91

WEATHER	Snow	Clear AM	Bright Sun	Overcast	Fog	Rain
TEMP.	To 32	32-50 AM	50-70 PM	70-85	85-90	90-
WIND	Still	X	Moder	High		
HUMIDITY	Dry	X	Moder	Humid		

Report No. 23

DAILY REPORT

Trench 10

0700 @ site Poly American on site No freezing was observed overnight @ wash pad

0800 - P.A. Preforming Pre weld test on Ext. & mouse - P.A. Air pressure ~~& Vac~~ testing Completed seams & Vaccum testing completed repair

0900 - Prewelds pass - Detail work Begins -

0930 - Recive five Destructive samples for testing - P.A. Begins Deployment of Geotextile fabric with proper overlap and continuesly sewing seams -

1030 - Destructive testing Complete All samples PASS - P.A. Seaming North Tie in Seam

1200 Lunch

1230 - P.A. Preforms Pre weld test on Extruder - Contines Deploying Geotextile fabric with continuesly sewn seams - test pass on Ext. U.S. Ecology placing soil on completed Geo Synthetics in 18" Loose lift No Damage was observed - U.S. Ecology using ~~SP~~ Ingersoll Rand - SP 48 DD vibratory drum roller making 8+ passes on loose lift.

1430 - P.A. Preforms Preweld test on mouse test pass.

1500 - P.A. Deploys H.D.P.E. Liner - Seaming Begins U.S. Ecology continues to place soil on completed GeoSyn. In 18" Loose lifts No Damage was observed ~~on~~ Drum Roller making 8+ passes on place soil.

1700 - Exit site Scott Davis W.C.C. C. Piper, 3 tech, 5 Labours 54,000 Sqft Geotextile - 6,600 Sqft Geomembrane Installed

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Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology Beatty NV.

PROJECT NO.: 90H3121C - Trench 10

CLIENT: U.S. Ecology

DATE: 1-10-91

DAY	S	M	T	W	Th	F	S
					X		

WEATHER	Snow	Clear Am	Little Sun	Overcast	Fog	Rain
TEMP.	To 32	32-50 Am	50-70	70-85	85-90	90-100
WIND	Still X		Moder	High	Report No. 22	
HUMIDITY	Dry X		Moder	Humid		

DAILY REPORT

Trench 10

0700 @ Site Poly America on Site No Freezing was Observed @ Wash pad Concrete

0830 - Poly America Performing Pre weld test - Mice & Extruder And Deploying Geotextile Fabric with proper overlap and continue Sewing Seams -

0900 - test pass on Mouse & Extruder - Detail work Begins
P.A. - Begins Deployment of H.D.P.E. Liner

1000 - Deployment of Geosynthetics continues -

1030 - Results from 7 Day Break on First Set of Cylinders from Washpad 2290 psi At Break -
Poly America Air Pressure testing of Completed Seams -
Vaccum testing of Completed Repairs -

1200 - Lunch -

1230 - P.A. Performing Pre welds on Mouse & Ext - U.S. Ecology Placing Soil on Completed Geosynthetics - In 18" Lift No Damage was Observed - P.A. Continues to Deploy Geotextile Fabric & H.D.P.E. Liner - Air pressure testing - Vaccum testing of Repairs & Tie In seam (North)

1300 - Pre weld tests on Mouse pass - Seaming Begins

1400 - Pre weld (Extruder) pass Repair Work Begins

1600 - U.S. Ecology Placing Soil on Completed Geosynthetics In 18" Loose Lift No Damage was Observed

1700 Exit site - 33,000 Sqft Geomembrane Installed - 50,400 Sqft Geotextile Installed - Scott Davis W.C.C., C Piper 3 techs, 5 Laborers Poly America

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Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology Beatty NV.

PROJECT NO.: 90M312IC - Trench 10

CLIENT: U.S. Ecology

DATE 1-9-91

DAY	S	M	T	W	TH	F
AM/PM				X		

WEATHER	Snow	Clear	Little Sun	Overcast	Fog	Rain
				AM		
TEMP.	To 32	32-50	50-70	70-85	85-90	90-1..
		AM				
WIND	Still	X	Moder	High	Report No.	
HUMIDITY	Dry		Moder X	Humid	21	

DAILY REPORT

Trench 10

0700 - @ site - Poly America on Site - Circuit Contractor Covered Concrete Poured 1-8-91 with Plastic No freezing was Observed over night - Plastic Remained In place

0900 - P.A. Preform Preweld test - And Air Testing of Seams Completed 1-8-91. All Passed -

0930 - Pre welds Pass - (Mouse & Extruder) North Tie In Seam Being Seamed - & Detail work - 4 Destructive Samples were marked for Poly America to Remove As Extruder works to Locations

0900 - Poly America Deploying Geotextile Fabric on Accepted Subgr. And H.D.P.E. Liner - Fabric Being placed with proper over Lap then Continuesly Sewn.

1100 - Recived 4 Destructive Samples from P.A. for testing Slight Rain Stops work with Extruder. P.A Continu Deploying Geotextile Fabric

1200 - Lunch

1300 - P.A Preforms Pre weld test on Mouse & Ext test pass. Panel & Fabric Deployment continues

1400 - Destructive Samples Are tested All Pass. U.S. Ecology Placing Soil on Completed Geosynthetics East → west in 18" Loose Lift No Damage was observed.

1600 - P.A Continues Deploying Fabric Continuesly Sewing Seams - U.S. Ecology Continues Placing Soil 18" Loose Lift No Damage was observed

1700 - Exit Site Scott Davis W.C.C. - C. Piper - 3 techs 5 Laborers - Poly America
26,400 sq ft H.D.P.E. Liner - 43,200 sq ft Geotextile Installed.

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Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology Beatty NV

PROJECT NO.: 90H3121C – Trench 10

CLIENT: U.S. Ecology

DATE 1-8-91

DAY	AM/PM	S	M	T	W	TH	F
				X			

WEATHER	Snow	Clear	Brite Sun	Overcast	Fog	
		Am / Pm				
TEMP.	To 32	32–50 Am	50–70 Pm	70–85	85–90	90–
WIND	Still	X	Moder	High	Report No.	
HUMIDITY	Dry	X	Moder	Humid	20	

DAILY REPORT

Trench 10

0700 – @ site Poly America on site

0730 – P.A. Deploying Geotextile FABRIC with proper overlap And continuously Sewing Seams

0805 – First concrete truck arrives for wash pad pour

0900 – ETEC arriving for testing of concrete

1000 – P.A. performs pre weld test – test pass – P.A. Begins Deployment of ~~H~~ H.D.P.E. Liner over previously Deployed Geotextile FABRIC And Seaming with mouse

1100 – Concrete test preformed 4" Slump – 4.3% Air Concrete temp 55°F Ambient 52°F – Concrete contractor using vibrator as concrete is placed.

1200 – Lunch

1230 – P.A. preforms pre weld – test pass. P.A. Continue Deploying Geomembrane And Seaming with mouse

1330 – P.A. Begins Air press testing of completed Seam

1400 – Final pour of walls at wash pad by concrete contractor. Using vibrator as wall is poured.

1500 – P.A. Continues Deployment of Fabric & H.D.P.E. Liner – Continuously Sewing Seams – And welding Seams –

1700 – 39,800 Sq ft H.D.P.E. Liner Installed, 42,000 Sq ft Geotextile FABRIC Installed.

Exit site Scott D Alic W.C.C. C. Piper, I. Jorc B. Cole, D London & two Laborers – Poly America

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Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology Beatty NV.

PROJECT NO.: 90H3121C Trench 10

CLIENT: U.S. Ecology

DATE 1-9-91

WEATHER	Snow	Clear	Bright Sun	Overcast X	Fog	Rain
TEMP.	To 32	32–50 AM	50–70	70–85	85–100	100+
WIND	Still	X	Moder	High		
HUMIDITY	Dry		Moder X	Humid		

Report No. 17

DAILY REPORT

Trench 10

0700 @ site - Poly America on site. No freezing at site was observed over night. Plastic sheet remained in place over concrete.

0800 - Poly America begins deployment of geotextile fabric for cap trench 10. Installing with proper over lap then continuesly sewing seams.

0900 - Pre weld preformed on mouse (fusion seamweld) test pass

1030 - Poly America begins deployment of geomembrane

1100 - Richard Soennichsen of Woodward Clyde arrive tour the site trench 10, trench 11, washpad.

1200 lunch

1230 - Pre welds preformed on mouse (fusion seamwelder) test pass

1300 - Geotextile fabric & geomembrane deployment continues

1400 - Richard Soennichsen exit site -

1500 - Seaming ~~of~~ panels continues

1700 - Exit site - 19,800 sqft of geotextile & geomem deployed on trench 10 cap - Scott Nuts w C. Dire, T. Jordan, D. Longdow, 3 laborers Poly America -

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Woodward Clyde Consultants

PROJECT NAME: U.S. Ecology Beatty NV.

PROJECT NO.: 90H3121C — Trench 10

CLIENT: U.S. Ecology

WEATHER	Snow	Clear	Bright Sun	Overcast X	Fog	Rain
TEMP.	To 32	32–50 AM	50–70	70–85	85–90	90–
WIND	Still	X	Moder	High	Report No.	
HUMIDITY	Dry		Moder X	Humid	16	

DAY AM PM: X

DAILY REPORT

Trench 10

0700 @ Site Poly America on site preparing to place
~~AS~~ Geotextile Fabric for Trench 10 ovap By Stockpil
Materials at locations around prepared subgrade
0930 - Concrete Contractor on site they will pour wast
pad tank floor today
1030 - First concrete truck arrives concrete pouring
Begins -
1100 - Concrete tests pass - 3" slump, 4.2% air,
Concrete 53°F Ambient 50°F 4 Cylinder made
1330 - Concrete pour complete. Crew setting up forms
for walls to Be poured 1-8-91
1400 - Poly America Exit site. C. Piper, I. Jorom. D.
~~US~~ Plastic Sheet placed on Concrete for overnight pro
1500 Exit site Scott Davis W.C.C.

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PROJECT NAME: U.S. Ecology Beatty NV

PROJECT NO.: 90H3121C - Trench 10

CLIENT: U.S. Ecology

DAY	AM/PM						
					X		

WEATHER	Snow	Clear X	Brite Sun	Overcast	Fog	Rain
TEMP.	To 32 AM	32-50 Warm	50-70	70-85	85-90	90-
WIND	Still	X	Moder	High	Report No.	
HUMIDITY	Dry	X	Moder	Humid	15	

DAILY REPORT

Trench 10

0730 @ Site

0900 - Poly America on site setting up trailer

0930 - Concrete Contractor on site Installing water Stop at Washpad in preparation for pour 1-3-91

1100 - Poly America Setting up equipment

1200 - Lunch

1230 - Concrete Contractor complete setting up for Pour 1-3-91

1530 - Exit Site

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Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology Beatty NV.

PROJECT NO.: 90HJ121C - WASH PAD

CLIENT: U.S. Ecology

DAY	AM/PM	S	M	T	W	TH	F	S
						X		

WEATHER	Snow	Clear ✓	Little Sun	Overcast	Fog	Rain
TEMP.	To 32	32–50 AM	50–70	70–85	85–90	90–100
WIND	Still	X	Moder	High	Report No.	
HUMIDITY	Dry	X	Moder	Humid	12	

DAILY REPORT

WASH PAD

0530 - @ site Concrete Contractor on site Setting Forms, Rebar and Dry Lock at Wash Pad as per Plans & Specs

1200 - Lunch

1300 - Wash Pad Concrete Forms Complete As per Plans & Specs.

1330 - Exit Site Scott Davis W.C.C.

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PROJECT NAME: U.S. Ecology, Beatty NV.

PROJECT NO.: 90H3021C

CLIENT: U.S. Ecology

PM	X	X	X	X		
WEATHER	Snow	Clear	Bright Sun	Overcast	Fog	Rain
TEMP.	To 32	32–50	50–70	70–85	85–90	90–
WIND	Still		Moder	High	Report No.	
HUMIDITY	Dry		Moder	Humid	11	

DAILY REPORT

NO WORK XMASS Holidays 12-22→26-90.

CHK'D BY:

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8810390

PROJECT NAME: U.S. Ecology Beatty NV.

PROJECT NO.: 90H3121C - WASH PAD

CLIENT: U.S. Ecology

DAY	AM PM	S	M	T	W	TH	F X

WEATHER	Snow	Clear ✓	Brite Sun	Overcast	Fog	Rain
TEMP.	To 32 AM	32-50	50-70	70-85	85-90	90-
WIND	Still		Moder ✓	High	Report No.	
HUMIDITY	Dry		Moder ✓	Humid	10	

DAILY REPORT

WASH PAD

0800 ON SITE

0830 - Concrete Contractor on site Building Forms & Placing Steel for wash pad Concrete

1100 — Concrete Contractor & U.S. Ecology Placing Sand on wash Pad Liner using CAT 416 Backhoe & Square point Shovels no Damage to H.D.P.E. Liner was observed

1200 - Lunch

1300 — Concrete Contractor Continues Erecting Forms & Placing Steel for wash pad concrete as per plans & Specifications

1600 Exit Site N.C.C. — Scott Davis

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Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology Beatty, NV.

PROJECT NO.: 9043RIC - WASH PAD

CLIENT: U.S. Ecology

DATE 12-20-90

DAY	S	M	T	W	Th	F	S
					X		

WEATHER	Snow	Clear	Brite Sun	Overcast	Fog	Rain
		X				

TEMP.	To 32	32-50	50-70	70-85	85-90	90-100
	AM	PM				

WIND	Still	Moder	High
	X AM		

HUMIDITY	Dry	Moder	Humid
	X		

Report No. 9

DAILY REPORT

WASH PAD

0700 - @ site

0800 - Shiped Bentonite Sample to Western Clay for Comparison - Wyo-Ben-Envirogel → Western Clay Product.

0830 - Concrete Crew on site they will continue placing Sand & Setting up forms for Wash Pad.

1030 - Concrete Contractor continues to place Sand using Square point Shovels no Damage was observed to H.D.P.E Liner at Wash Pad.

1200 - Lunch

1300 - Concrete Contractor continues to place Sand on Wash Pad using Square point Shovels no Damage was observed to H.D.P.E. Liner.

1530 - Exit Site Scott Davis W.C.C.

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SIGNATURE: [signature]

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Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology/Beatty NV.

PROJECT NO.: 90H3121C-WASHPAD

CLIENT: U.S. Ecology

DATE 12-19-90

DAY: X (Thursday)

WEATHER	Snow	Clear	Bright Sun	Overcast	Fog	Rain
		X				

TEMP.	To 32	32-50	50-70	70-85	85-90	90 up
	AM	PM				

WIND	Still	Moder	High	Report No.
	AM		PM	8

HUMIDITY	Dry	Moder	Humid
	X		

DAILY REPORT

WASHPAD

0700 - @ site.

0900 - Concrete Contractor on site preparing forms for WASHPAD POUR - 12-27-90

1000 - U.S. Ecology preparing surface to perform SAND/WATER MIX ~~&~~ stockpile for WASHPAD

1100 - FORM Building & ~~water~~ SAND/WATER Mix Blending continues

1200 - Lunch -

1230 - U.S. Ecology placing SAND on WASHPAD Liner & Concrete Contractor placing SAND By hand using Square point shovels NO DAMAGE OBSERVED to H.DPE. WASH PAD Liner

1430 Concrete Contractor & U.S. Ecology Continue to place SAND on WASHPAD Liner using Square Point Shovels no Damage liners observed

1600 - Exit site Scott Davis W.C.C.

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Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology Beatty, NV.

PROJECT NO.: 90H3121C - Wash Pad

CLIENT: U.S. Ecology

DATE 12-18-90

DAY AM PM

WEATHER: Snow | Clear ✓ | Bright Sun | Overcast | Fog | Rain

TEMP.: To 32 | 32-50 AM ✓ | 50-70 | 70-85 | 85-90 | 90

WIND: Still | Moder. ✓ | High | Report No.

HUMIDITY: Dry ✓ | Moder. | Humid

DAILY REPORT

WASH PAD

0700 - @ site Poly America Coating Utility trailer to leave site today will Return 1-2-91.

0830 - Attended meeting with U.S.E. Welsh, P.A. - See Meeting Report #01-12-18-90 for Details -

0930 - P.A. Exits site -

1100 - Exit site, Scott Davis W.C.C.

CHK'D BY:

SIGNATURE:

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Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology Beatty N.J.

PROJECT NO.: 90H3121C - WASH PAD

CLIENT: U.S. Ecology

DATE 12-17-90

DAY AM PM: S M T W Th F S — X (M)

WEATHER	Snow	Clear	Bright Sun	Overcast	Fog	Rain
		X				
TEMP.	To 32	32-50	50-70	70-85	85-90	90-...
		AM/PM				
WIND	Still		Moder	High	Report No.	
				X	6	
HUMIDITY	Dry		Moder	Humid		
	X					

DAILY REPORT

WASH PAD

0700 @ site Poly America on site. High winds During Weekend of 12-15, 16-90 have Blown wash pad liner off of pad P.A. will attempt to pull liner Back Into place

0830 - P.A. has liner In place NO MAJOR DAMAGE wi... observed P.A. will Repair minor Damage as needed - Pre welds are performed

0930 - Pre welds Pass - P.A. begins Repair work Geotextile FABRIC Arrives P.A. UNLOADS material

1030 - FABRIC UNLOADED NO DAMAGE OBSERVED P.A. has placed Rolls of FABRIC AND Liner as Ballast to prevent Another Blow out

1300 - 2ND load of Geotextile FABRIC ARRIVED P.A. UNLOADS NO DAMAGE OBSERVED -

1430 - Repairs Completed

~~1430~~ 1530 Exit site - Scott Davis W.C.C. C. Piper, K.B... J. Jordan, D. London, Poolan Poly America

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SIGNATURE: [signature]

88103909

Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology - Beatty

PROJECT NO.: 90H3121C

CLIENT: U.S. Ecology

DATE 12-16-90

DAY AM PM | S | M | T | W | TH

WEATHER	Snow	Clear	Brite Sun	Overcast	Fog	R
TEMP.	To 32	32-50	50-70	70-85	85-90	
WIND	Still		Moder	High	Report No.	
HUMIDITY	Dry		Moder	Humid	5	

DAILY REPORT

NO WORK TODAY

CHK'D BY: [signature]

SIGNATURE: [signature]

00103909

Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology Beatty

PROJECT NO.: 90H3021C

CLIENT: U.S. Ecology

DATE 12-13-70

DAY AM PM | S | M | T | W | Th | F

WEATHER	Snow	Clear	Bright Sun	Overcast	Fog	
TEMP.	To 32	32-50	50-70	70-85	85-90	90
WIND	Still		Moder	High	Report No.	
HUMIDITY	Dry		Moder	Humid	4	

DAILY REPORT

NO WORK TODAY

CHK'D BY: [illegible]

SIGNATURE: [illegible]

88103909

Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology / Beatty NV.

PROJECT NO.: ~~[illegible]~~ 90H3121C-WASHPAD

CLIENT: U.S. Ecology

DATE: 12-14-90

DAY: AM PM | | | | | | X

WEATHER	Snow	Clear X	Bright Sun	Overcast	Fog	Ra...	
TEMP.	To 32 AM	32–50 AM PM	50–70 PM	70–85	85–90	90...	
WIND	Still	X	Moder	High	Report No. 3		
HUMIDITY	Dry	X	Moder	Humid			

DAILY REPORT

WASH PAD

0700 @ Site Poly America on site -

0730 - P.A. Vacuum Box testing of Repairs made 12-13-90.
V. Box Pass -

0800 - P.A. Making Repairs on Equipment As needed -

1030 - Sent Conformance Sample of 80 mil HDPE to
Lab for testing -

1200 - Lunch

1300 - P.A. Continues Repairs on Equipment -

1630 - Exit Site - Scott Davis W.C.C., C. Piper, K Be...
I Jordan D. Poolan D Lundun Poly America

CHK'D BY: [signature]

SIGNATURE: [signature]

08103909

Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology, Beatty NV.

PROJECT NO.: 90H3121C - WASH PAD

CLIENT: U.S. Ecology

DATE 12-13-90

DAY AM PM X

WEATHER	Snow	Clear X	Bright Sun	Overcast	Fog
TEMP.	To 32	32-50 Am	50-70	70-85	85-90
WIND	Still	X	Moder	High	Report No.
HUMIDITY	Dry	X	Moder	Humid	2

DAILY REPORT

WASH PAD

0700 - @ site Poly America on site.

0730 - Shipment of 80mil HDPE Arrives P.A. offloading Also Boxes of Welding Rod., Stockpiling Sandbags Trench to cap.

0830 - offloading of Liner complete No Damage was observed - Inventory taken of All materials Received

0930 - P.A. Filling Sand Bags for future use -

1000 - P.A. Setting up Extruder to Repair Wash Pad Liner performing Preweld.

1030 - Preweld pass - Extruding Begins

1100 - Repairs Completed.

1200 - Lunch -

1300 - P.A. Continues filling SANDBAGS -

1430 - P.A. Prefabricating Holding tank Liner As per U.S. Ecol Request -

1630 - Exit site, Scott Davis W.C.C., C. Price, I. Lozman K.B. D. Poolaw, D. Lundow Poly America -

CHK'D BY: [illegible]

SIGNATURE: [illegible signature]

SOUTHWEST GEOTECHNICAL CONSULTANTS
3280 WEST HACIENDA, SUITE 201
LAS VEGAS, NEVADA 89118
TELEPHONE (702) 795-7515

OUNDATION INVESTIGATIONS
EXPLORATORY DRILLING
STEEL ERECTION INSPECTION

SOILS, ASPHALT, CONCRE
QUALITY CONTROL
FOR CONSTRUCTION

Concrete Mix Design for: T and J Construction
Project No.: RLV-2090
Issue Date: January 30, 1990

Concrete Mix Design: T & J D 2
4000 psi at 28 days - Type V Cement - 6.5 sack/yd.^{3}
W/C = 0.443
Slump: 4" Maximum
Aggregate: Lathrop Wells Pit

Mix Proportion for 1 cubic yard:

		Batch Weight (lbs)	Absolute Volume (Ft.^{3})
W.C. Sand	42%	1150	7.650
Coarse Aggregate (No. 67)	58%	1780	10.565
Water (5.0 gal/sack)		271	4.327
Cement (6.5 sack)		611	3.108
Entrained Air: 5% Maximum		---	1.350
		3812	27.000

Admixture: Airin X - 4.0 fl.oz./100 lbs. cement
Master Builders Pozzolith 322N - 5.0 fl.oz./100 lbs. cement

Note: For water in sand in excess of 5.0%, make weight corrections: for each 1.0% excess of water, deduct 12 lbs. (1.5 gallons) mixing water and add 12 lbs. sand.

Theoretical Unit Weight = 141.2 lbs./cu.ft.

Information utilized for Mix Design Computations:

	Fine Aggregate	Coarse Aggregate
F.M.	2.88	-
S.G.	2.41	2.70
Absorption	2.51	2.27

Respectfully submitted,

SOUTHWEST GEOTECHNICAL CONSULTANTS

REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA
JIMMY H SINGH
CIVIL

Jimmy H Singh

Received 12-11-90
W.C.C.

FIELD/LABORATORY DATA - COMPRESSIVE STRENGTH TESTS

Client: US ECOLOGY Job No.:

Address:

Project: US ECOLOGY BEATTY

Location in Structure: WASH PAD TANK FLOOR

Source of Sample: WEST END OF TANK FLOOR

Contractor: T&J Ticket No:

Arch/Engineer: Measured Slump. in.: 3"

Material Supplier: T&J Measured Air Content: 4.2%

Batch Size/CY: 10 CYS Concrete Temp., °F: 53°

Mix Identification: Ambient Air Temp, °F: 50°

Design Strength PSI: 4000 / 28 Days Plastic Unit Weight, pcf: /

Nominal Size Aggregate: 3/4 No. of Cylinders Molded: 4

Time Sampled: 1145 Specimen Size: 6X12

Field Curing Conditions: CURE BOX Area, sq.in.: 28.27

Sampled By: SCOTT THORNE Date: 1·3·91 Time in Mixer: Hr Mi

Submitted By: SCOTT THORNE Date: · · Water Added on Job: 4 Gal

Authorized By: Date: Test Procedure: ASTM C39-8

REMARKS: CONCRETE PLACED BY CHUTE

Specimen Marking If Any	Date Tested	Specimen Age In Days	Compressive Strength Maximum Load: Pounds Force	Compressive Strength Maximum Load: p s i	Type Fracture if Other Than Cone	Defects in Specimens/ Caps If Any	Tested By
1	1·10	7					
2	1·31	28					
3	1·31	28					
4	1·31	HOLD					
						1-30-91	

ETEC TESTING LABORATORIES, INC.

4150 W. Pioneer Ave., Suite A • Las Vegas, NV 89102
(702) 367-0100

LABORATORY REPORT
COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS

CLIENT: Woodward - Clyde Consultants
7330 Westview Drive
Houston, Texas 77055

JOB NO.: 12037- 1
DATE OF REPORT: 01-11-91

Project: US ECOLOGY - Beatty, Nevada (WCC #90H3121C)

Location in Structure: Wash Pad Tank Floor

Source of Sample: West End of Tank Floor

Contractor: T & J

Ticket No: NA

Arch/Engineer: NA

Measured Slump: 3 in

Material Supplier: T & J

Measured Air Content: 4.2%

Batch Size/CY: 10

Concrete Temp: 53

Mix Identification: 6.0 Sacks

Ambient Air Temp: 50

Design Strength PSI: 4000 / 28 Days

Plastic Unit Weight, pcf: ---

Nominal Size Aggregate: 3/4

No. of Cylinders Molded: 4

Sampled By: S.Thorne/ETEC Date: 01-03-91

Time in Mixer: NA Hr. NA

Submitted By: S.Thorne/ETEC Date: 01-08-91

Water Added on Job: 4

Authorized By: S.Davis/WCC Date: ---

Test Procedure: ASTM C39-8

NOTE: Cylinders are 6"x 12": Area = 28.27 sq. in. unless otherwise

REMARKS: Concrete placed by chute and vibrated into place

Specimen Marking If Any	Date Tested	Specimen Age In Days	Compressive Strength Maximum Load		Type Fracture if Other Than Cone	Defects Specimens Caps If Any	Tes E
			Pounds Force	p s i			
1A	01-10-91	7	64764	2290			
1B	01-31-91	28					
1C	01-31-91	28					
1D	01-31-91	HOLD					

CC: (1/M) Client; Don Colbourne

REVIEWED BY: Kulwant S. Sahi, P

SOILS INVESTIGATION AND FOUNDATION ENGINEERING; CONCRETE AND MATERIAL CONSULTANTS; ... NON-DESTRUCTIVE STEEL AND WELDING CERTIFICAT

ETEC TESTING LABORATORIES, INC.
4150 W. Pioneer Ave., Suite A • Las Vegas, NV 89102
(702) 367-0100

LABORATORY REPORT
COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS

CLIENT: Woodward - Clyde Consultants
7330 Westview Drive
Houston, Texas 77055

JOB NO.: 12037- 1
DATE OF REPORT: 01-11-91
01-17-91

Project: US ECOLOGY - Beatty, Nevada (WCC #90H3121C)
Location in Structure: Wash Pad Tank Floor
Source of Sample: West End of Tank Floor
Contractor: T & J
Arch/Engineer: NA
Material Supplier: T & J
Batch Size/CY: 10
Mix Identification: 6.0 Sacks
Design Strength PSI: 4000 / 28 Days
Nominal Size Aggregate: 3/4
Sampled By: S.Thorne/ETEC Date: 01-03-91
Submitted By: S.Thorne/ETEC Date: 01-08-91
Authorized By: S.Davis/WCC Date: ---

Ticket No: NA
Measured Slump: 3 i
Measured Air Content: 4.2%
Concrete Temp: 53
Ambient Air Temp: 50
Plastic Unit Weight, pcf: ---
No. of Cylinders Molded: 4
Time in Mixer: NA Hr. NA
Water Added on Job: 4
Test Procedure: ASTM C39-

NOTE: Cylinders are 6"x 12"; Area = 28.27 sq. in. unless otherwise

REMARKS: Concrete placed by chute and vibrated into place

Specimen Marking If Any	Date Tested	Specimen Age In Days	Compressive Strength Maximum Load		Type Fracture if Other Than Cone	Defects Specimens Caps If Any	Te
			Pounds Force	p s i			
1A	01-10-91	7	64764	2290			
1B	01-17-91	14	77134	2730			
1C	01-31-91	28					
1D	01-31-91	28					

CC: (1/M) Client; Don Colbourne

REVIEWED BY: Kulwant S. Sahi

Kulwant S. Sahi,

ETEC TESTING LABORATORIES, INC.
4150 W. Pioneer Ave., Suite A • Las Vegas, NV 89102
(702) 367-0100

LABORATORY REPORT
COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS

CLIENT: Woodward - Clyde Consultants
7330 Westview Drive
Houston, Texas 77055

JOB NO.: 12037- 1
DATE OF REPORT: 01-11-91
01-17-91
02-04-91

Project: US ECOLOGY - Beatty, Nevada (WCC #90H3121C)

Location in Structure: Wash Pad Tank Floor

Source of Sample: West End of Tank Floor

Contractor: T & J

Ticket No: NA

Arch/Engineer: NA

Measured Slump: 3 i

Material Supplier: T & J

Measured Air Content: 4.2%

Batch Size/CY: 10

Concrete Temp: 53

Mix Identification: 6.0 Sacks

Ambient Air Temp: 50

Design Strength PSI: 4000 / 28 Days

Plastic Unit Weight, pcf: ---

Nominal Size Aggregate: 3/4

No. of Cylinders Molded: 4

Sampled By: S.Thorne/ETEC Date: 01-03-91

Time in Mixer: NA Hr. NA

Submitted By: S.Thorne/ETEC Date: 01-08-91

Water Added on Job: 4

Authorized By: S.Davis/WCC Date: ---

Test Procedure: ASTM C39-

NOTE: Cylinders are 6"x 12"; Area = 28.27 sq. in. unless otherwise

REMARKS: Concrete placed by chute and vibrated into place

Specimen Marking If Any	Date Tested	Specimen Age In Days	Compressive Strength Maximum Load		Type Fracture if Other Than Cone	Defects Specimens Caps If Any	Te
			Pounds Force	p s i			
1A	01-10-91	7	64764	2290			
1B	01-17-91	14	77134	2730			
1C	01-31-91	28	97420	3450			
1D	01-31-91	28	96316	3410			

CC: (1/M) Client; Don Colbourne

REVIEWED BY: Kulwant S. Sahi,
Kulwant S. Sahi,

FIELD/LABORATORY DATA - COMPRESSIVE STRENGTH TESTS

Client: U.S. ECOLOGY Job No.: 12037-2

Address:

Project: U.S. ECOLOGY BEATTY

Location in Structure: WASH PAD

Source of Sample: CENTER OF WASH PAD

Contractor: T&J Ticket No:

Arch/Engineer: Measured Slump. in.: 4"

Material Supplier: T&J Measured Air Content: 4.3%

Batch Size/CY: 8 CYS Concrete Temp., °F: 55°

Mix Identification: Ambient Air Temp, °F: 52°

Design Strength PSI: 4000 / 28 Days Plastic Unit Weight, pcf: /

Nominal Size Aggregate: 3/4 No. of Cylinders Molded: 4

Time Sampled: 1100 Specimen Size: 6X12

Field Curing Conditions: CURE BOX Area, sq.in.: 28.27

Sampled By: SCOTT THORNE Date: 1·8·91 Time in Mixer: Hr Mi

Submitted By: SCOTT THORNE Date: · · Water Added on Job: 5 Gal

Authorized By: Date: Test Procedure: ASTM C39-8

REMARKS: CONCRETED PLACED BY CHUTE AND VIBRATED INTO PLACE

Specimen Marking If Any	Date Tested	Specimen Age In Days	Compressive Strength Maximum Load		Type Fracture if Other Than Cone	Defects in Specimens/ Caps If Any	Tested By
			Pounds Force	p s i			
2A	1·15	7					
2B	2·5	28					
2C	2·5	28					
2D	2·5	HOLD					
						1-8-91	

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(702) 367-0100

LABORATORY REPORT
COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS

CLIENT: Woodward - Clyde Consultants
7330 Westview Drive
Houston, Texas 77055

JOB NO.: 12037- 2
DATE OF REPORT: 01-16-91

Project: US ECOLOGY - Beatty, Nevada (WCC #90H3121C)

Location in Structure: Wash Pad

Source of Sample: Center of Wash Pad

Contractor:	T & J	Ticket No:	NA
Arch/Engineer:	NA	Measured Slump:	4 in
Material Supplier:	T & J	Measured Air Content:	4.3%
Batch Size/CY:	8	Concrete Temp:	55
Mix Identification:	NA	Ambient Air Temp:	52
Design Strength PSI:	4000 / 28 Days	Plastic Unit Weight, pcf:	---
Nominal Size Aggregate:	3/4	No. of Cylinders Molded:	4
Sampled By:	S.Thorne/ETEC Date: 01-08-91	Time in Mixer:	NA Hr. NA
Submitted By:	S.Thorne/ETEC Date: 01-10-91	Water Added on Job:	5
Authorized By:	S.Davis/WCC Date: ---	Test Procedure:	ASTM C39-8

NOTE: Cylinders are 6"x 12"; Area = 28.27 sq. in. unless otherwise

REMARKS: Concrete placed by chute and vibrated into place

Specimen Marking If Any	Date Tested	Specimen Age In Days	Compressive Strength Maximum Load: Pounds Force	Compressive Strength Maximum Load: p s i	Type Fracture if Other Than Cone	Defects Specimens Caps If Any	Tes E
2A	01-15-91	7	70796	2500			
2B	02-05-91	28					
2C	02-05-91	28					
2D	02-05-91	HOLD					

CC: (1/M) Client; Don Colbourne

REVIEWED BY: *Kulwant S. S[...]*
Kulwant S. Sahi, P

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(702) 367-0100

LABORATORY REPORT
COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS

CLIENT: Woodward - Clyde Consultants
7330 Westview Drive
Houston, Texas 77055

JOB NO.: 12037- 2
DATE OF REPORT: 01-16-91
02-06-91

Project: US ECOLOGY - Beatty, Nevada (WCC #90H3121C)
Location in Structure: Wash Pad
Source of Sample: Center of Wash Pad
Contractor: T & J
Ticket No: NA
Arch/Engineer: NA
Measured Slump: 4 inc
Material Supplier: T & J
Measured Air Content: 4.3%
Batch Size/CY: 8
Concrete Temp: 55
Mix Identification: NA
Ambient Air Temp: 52
Design Strength PSI: 4000 / 28 Days
Plastic Unit Weight, pcf: ---
Nominal Size Aggregate: 3/4
No. of Cylinders Molded: 4
Sampled By: S.Thorne/ETEC Date: 01-08-91
Time in Mixer: NA Hr. NA
Submitted By: S.Thorne/ETEC Date: 01-10-91
Water Added on Job: 5 G
Authorized By: S.Davis/WCC Date: ---
Test Procedure: ASTM C39-84

NOTE: Cylinders are 6" x 12"; Area = 28.27 sq. in. unless otherwise i

REMARKS: Concrete placed by chute and vibrated into place

Specimen Marking If Any	Date Tested	Specimen Age In Days	Compressive Strength Maximum Load		Type Fracture if Other Than Cone	Defects Specimens Caps If Any	Test By
			Pounds Force	p s i			
2A	01-15-91	7	70796	2500			D
2B	02-05-91	28	95515	3380			F
2C	02-05-91	28	95769	3390			F
2D	03-05-91	56					

CC: (1/M) Client; Don Colbourne

REVIEWED BY: Kulwant S. Sahi
Kulwant S. Sahi, P.

ETEC TESTING LABORATORIES, INC.
4150 W. Pioneer Ave., Suite A • Las Vegas, NV 89102
(702) 367-0100

LABORATORY REPORT
COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS

CLIENT: Woodward - Clyde Consultants
7330 Westview Drive
Houston, Texas 77055

JOB NO.: 12037- 2
DATE OF REPORT: 01-16-91
02-06-91
03-06-91

Project: US ECOLOGY - Beatty, Nevada (WCC #90H3121C)
Location in Structure: Wash Pad
Source of Sample: Center of Wash Pad
Contractor: T & J
Ticket No: NA
Arch/Engineer: NA
Measured Slump: 4 in
Material Supplier: T & J
Measured Air Content: 4.3%
Batch Size/CY: 8
Concrete Temp: 55
Mix Identification: NA
Ambient Air Temp: 52
Design Strength PSI: 4000 / 28 Days
Plastic Unit Weight, pcf: ---
Nominal Size Aggregate: 3/4
No. of Cylinders Molded: 4
Sampled By: S.Thorne/ETEC Date: 01-08-91
Time in Mixer: NA Hr. NA
Submitted By: S.Thorne/ETEC Date: 01-10-91
Water Added on Job: 5
Authorized By: S.Davis/WCC Date: ---
Test Procedure: ASTM C39-8

NOTE: Cylinders are 6"x 12"; Area = 28.27 sq. in. unless otherwise i

REMARKS: Concrete placed by chute and vibrated into place

Specimen Marking If Any	Date Tested	Specimen Age In Days	Compressive Strength Maximum Load Pounds Force	Compressive Strength Maximum Load p s i	Type Fracture if Other Than Cone	Defects Specimens Caps If Any	Tes B
2A	01-15-91	7	70796	2500			D
2B	02-05-91	28	95515	3380			R
2C	02-05-91	28	95769	3390			R
2D	03-05-91	56	101840	3600			R

CC: (1/M) Client; Don Colbourne

REVIEWED BY: Kulwant S. Sa
Kulwant S. Sahi, P.

E1 - CONTRACTOR'S DOCUMENTATION

- DAILY REPORTS

- SUBGRADE ACCEPTANCE

- HDPE WELDING ROD QC REPORT

POLY·FLEX, INC. daily field report
construction management services

project no.
project name U.S. Ecology
project location Beatty Nev.

date 1/18/91
weather Clear
contract days remaining

contractor's equipment

contractor's personnel

observations
Went to work @ 7:00 A.M.
Finished repairs and testing.
Truck load of fabric arrived.
Worked on wash pad
Laid 6 panels of fabric 450' long
32,400 sq ft

Total to Date
Fabric - 340,600 sq
Liner - 219,200 sq

photo meeting change order problem sheet conversatio

time arrived 7:00
time departed 5:00
signature

PF-009-5-90

Attachme

POLY·FLEX, INC. daily field report construction management services

date 1/17/91

project no.

weather Clear + Windy

project name U.S. Ecology

contract days remaining

project location Beatty Nev.

contractor's equipment

contractor's personnel

observations Went in @ 7:00 A.M.
Worked on testing and repairs.
Worked the cleanup on the wash pad.

Total to Date
Fabric - 305,200
Liner - 219,200

photo | meeting | change order | problem sheet | conversatio

time arrived 7:00 time departed 5:00 signature

1/17/91

Attachme

PF-009-5-90

POLY·FLEX, INC.

daily field report
construction management services

project no. G-1075

project name U.S. Ecology

project location Beatty Nev.

date ~~12/3/90~~ 1-5-91

weather Cloudy

contract days remaining

contractor's equipment

contractor's personnel

observations
- Loader arrived this morning.
- They started pouring wasp.a.d.
- We trimmed back exposed liner on cap.
- Sent techs home @ 2:00 pm because there was no area ready for us.
- I traveled to Las Vegas to pick up Alfonso and Agustin

photo | meeting | change order | problem sheet | conversatio

time arrived 7:00 Am

time departed 2:00 pm

signature

PF-009-5-90

1-6-91

Attachme

POLY·FLEX, INC. daily field report construction management services

project no.

date 12/14/90

project name U.S. Ecology

weather Clear

project location Beatty Nevada

contract days remaining

contractor's equipment

contractor's personnel

observations Went to work @ 7:00
Made sure all equipment was in work
order.
Vac tested repairs on wash pad.
Filled sand bags.

Worked 10 hrs.

photo meeting change order problem sheet conversatio

time arrived 7:00 time departed 5:00

signature

PF-009-5-90

12-1590

Attachme

POLY·FLEX, INC.

daily field report
construction management services

project no. ....

date 12/13/90

project name U.S. Ecology

weather Clear

project location Beatty Nevada

contract days remaining ....

contractor's equipment ....

contractor's personnel ....

observations
Went to work at 7:00 A.M.
Unloaded truck load of 80 mil and welding rod.
Had crew haul bags out of trench 11 for cap.
- Repaired seams on wash pad
Filled sand bags for rest of the day
Worked 10 hrs.

photo   meeting   change order   problem sheet   conversation

time arrived ....   time departed ....

signature

POLY·FLEX, INC. daily field report construction management services

project no.

date 12/12/90

project name U.S. Ecology

weather Cloudy

project location Beatty Nevada

contract days remaining

contractor's equipment

contractor's personnel

observations
- Went in at 7:00 A.M.
- Backhoe arrived from Heate
- Unloaded work trailer and organized
- Deployed fabric and 40 mil on wash pad all material was U.S. Ecology's
- Wedge welded and air tested all good
- Unloaded truck load of 30 mil sheet

40 mil - 2400 sq → Installed on Wash Pad
Fabric: 2400 sq

photo / meeting / change order / problem sheet / conversatio

time arrived 7:00 A.M.

time departed 5:00 P.M.

signature

12-13-90

Attachme

POLY·FLEX, INC. geomembrane air/vacuum test recorc

project no. ____ project name *U.S. Ecology*

project location *Beatty Nevada*

vacuum box no. ____ make ____ model ____

air testing

seam interval tested	tester's name	time	psi	pass/fail	date
Wash Pad 1/2	C J Piper	3:30	30 psi	Pass	12/12/9
Wash Pad 2/3	"	"	"	"	"
Wash Pad 3/4	"	"	"	"	"

vacuum testing

seam interval tested	tester's name	test failure location	test failure no.	repair date	retest approval
Wash Pad 1/2	Danny Poolaw	None	None	12/13/90	C.J.
Wash Pad 2/3	"	"	"	"	"

inspected by *C. J. Piper* date *12/14/90*

PF-006-5-90 *12-15-90* Attachme

POLY·FLEX, INC.

certificate of acceptance of soil subgrade

project name U.S. Embsy

project no.

location Beatty Nevada

installation contractor representative C.J. Piper

area to be accepted Wash Pad

I, the undersigned, duly authorized representative of the installer, do hereby accept the soil subgrade surface conditions and shall be responsible for maintaining its integrity and suitabi in accordance with the specifications. I do not accept any responsibility for the conditions or character of the subsurface soil, or any effects the soil might have on the liner system.

C.J. Piper	Superintendent	12/12/90
signature	title	date

PF-003-5-90

12-12-90

Attachm

JAN- 9 91 WED 11:01

POLY-AMERICA Inc.

2000 W. Marshall Drive Grand Prairie, Texas 75051

800-527-3322 214-647-4374 Telex 79-2851

FAX 214-988-833:

January 4, 1991

Ms. Jeanette Lear
U.S. Ecology, Inc.
9200 Shelbyville Rd. Suite 300
Louisville, KY 40222

Re: HDPE Welding Rod QC Report
US Ecology Trench 10 & 11 Construction
Beatty, NV

Dear Ms. Lear:

The following welding rod rolls were shipped to Beatty, NV for the above referenced project.

5mm Rod Roll No.	5mm Rod Roll No.	4mm Rod Roll No.
284	317	218
285	318	382
286	328	385
287	329	431
291	331	
292	332	
293	336	
295	337	
296	338	
302	339	
307	388	
308	389	
312	414	
313	424	

All 5mm rods were manufactured of Railcar RAIX 60671, Lot 431933
All 4mm rods were manufactured of Railcar CCBX 55230, Lot 431183
The resin QC and QA reports are attached.

Sincerely,

George M. Hall

George M. Hall
Plant Manager

RAILCAR RESIN REPORT

P. O. # 4770

Weight 185600

Date Received 10-11-90

Resin Code -

BUY INFORMATION

Railcar # RAIX 60671

Vendor UC

Lot # ____

Blend DEGD 1525

Type: LDPE ____ LLDPE ____

Other HDPE

Pressure: High ____ Low ____

Film Rating ____

Melt Index ____

Density ____

C-HB

Comments geo. Poly-Flex

Slip ____

Antiblock ____

Antioxidant ____

VA ____ EVA ____

EA ____

Other ____

CAR CAPACITY

Pellets ✓ Granular ____ Car Type 5250

Measurements:

inches:	A	12	CA	14	CB	11	B	12	TOTAL	
weight:	A		CA		CB		B		TOTAL	186

Release Information:

	Date	Time	Initials
Released to Production			
Released to Railroad			

+100

Comments ____

LABORATORY TESTING REPORT

R =

Resin Evaluation:										
Melt index:	A	.12 / .13	CA	.15 / .13	CB	.14 / .13	B	.14 / .14	Avg.	.14
Density:	A	.947 / .947	CA	.947 / .948	CB	.947 / .947	B	.947 / .948	Avg.	.947

Film Evaluation: Gauge: Range - Average ____

Width: ____ Dart Impact: ____

COF ____ C-Black Content: 2.4%

IR Analysis: Slip ____ VA ____ EA ____ AO ____

AB ____ EVA ____ Other (specify) ____

Comments: Poli-Flex

Film Use: Poly-flex Approved By: JN 10/11

PUMPING INFORMATION

Released for Pumping: ____ (Where) ____ (Date) ____ (Approved)

	Time Started	Time Finished
Compartment A		
Compartment CA		

RAILCAR RESIN REPORT

P. O. # 1914
Date Received 11-2-89

Weight 18075
Resin Code ÷

BUY INFORMATION

Railcar # CCBX55230
Vendor UC
Lot #
Blend DEGD1525
Type: LDPE ___ LLDPE ___
Other HDPE
Pressure: High ___ Low ___

Film Rating NA
Melt Index 0.15
Density .950
Comments Poly Flex
Black

Slip
Antiblock
Antioxidant
VA EVA
EA
Other

CAR CAPACITY

Pallets ✓ Granular ___ Car Type 5250

Measurements:

	A	CA	CB	B	TOTAL
inches:	15	32	13	10	
weight:					18(

Release Information:	Date	Time	Initials
Released to Production			
Released to Railroad	11-9-89	4:30pm	

Comments

LABORATORY TESTING REPORT

Melt Index Tor A 0.21 CA 0.20 CB 0.19 B 0.19
Melt Index Somm A 0.20 CA 0.18 CB 0.21 B 0.19

Resin Evaluation: ~~Melt index~~: A .949 CA .949 CB .949 B .950 Avg. 0.20

Density: A .949 CA .950 CB .949 B .949 Avg. 0.949

Film Evaluation: Gauge: Range - Average

Width: Dart Impact:

COF C.Blk.Ash Content: A 2.2, CA 2.1, CB 2.1,

IR Analysis: Slip ___ VA ___ EA ___ AO ___
AB ___ EVA ___ Other (specify) ___

Comments: Poly-Flex - MI slightly higher normal

Film Use: Poly-Flex Approved By: JN 11/2

PUMPING INFORMATION

Released for Pumping: SIL #20 (Where) 11-3-89 (Date) (Approved)

	Time Started	Time Finished
Compartment A		
Compartment CA		

JAN- 9-91 WED 11:55

-1-24-1989 14:42 FROM UNION CARBIDE SEADRIFT TX TO 9-1 214 647 4374233 P.02

PRODUCT QUALITY REPORT

FAX NO. 214-647-4374 EXT. 233
OR NO. 214-647-8061
POLY AMERICA INC.
GRAND PRAIRE, TX 75051
: G. URVIS

UNION CARBIDE CORPORAT
POLYOLEFINS DIVISION
P.O. BOX 186
PORT LAVACA, TEXAS 779

OCTOBER 24, 1989

PRODUCT NAME	SEGD-1525 BK	
BLEND NUMBERS	445668	431183
QUANTITY, LBS.	90,350	90,350
CONTAINER	CCBX55230	CCBX55230
CUSTOMER ORDER NO.	VBL	
UCC ORDER NO.	440762	
SHIPPING DATE	10/24	

SHIPPED TO: GRAND PRAIRIE, TX

THE FOLLOWING TEST DATA WAS OBTAINED:

	445668	431183
INDEX	0.15	0.16
ITY ASTM	0.9500	0.9495
TIME 200 C MIN	117.	110.
CARBON BLACK	2.4	2.3
ANALYSIS NO.	1041020	601022

P.O. 1914

Wayne Dagger

QUALITY CONTROL DEPARTMEN
SEADRIFT PLANT LABORATORY

11-5

11-6

.OCT-09-1990 15:02 FROM SEADRIFT,LPPE-I LAB TO 912146478061 P.02

PRODUCT QUALITY REPORT

.AX NO. 214-647-8061 X 208
POLY AMERICA INC.
AND PRAIRE, TX 75051
TN: SHAWNEE DORADO

UNION CARBIDE CHEMICALS
AND PLASTICS COMPANY INC.
POLYOLEFINS DIVISION
P.O. BOX 186
PORT LAVACA, TEXAS 77979

OCTOBER 9, 1990

PRODUCT NAME	DEGD-1525 BK	
B END NUMBERS	431933	431934
QUANTITY, LBS.	92,800	92,800
CONTAINER	RAIX60671	RAIX60671
C STOMER ORDER NO.	4770	
U.J ORDER NO.	447476	
SHIPPING DATE	10/05	

S PPED TO: GRAND PRAIRIE, TX

THE FOLLOWING TEST DATA WAS OBTAINED:

	431933	431934
T INDEX	0.15	0.11
I21	16.	14.
DENSITY ASTM	0.9485	0.9490
CARBON BLACK	2.2	2.4
IN TIME 200 C MIN	113.	116.
ANALYSIS NO.	741003	1761003

Wayne Deggs

QUALITY CONTROL DEPARTMENT
SEADRIFT PLANT LABORATORY

E2 - WOODWARD-CLYDE CONSULTANTS' DOCUMENTATION

- PANEL PLACEMENT LOG
- TRIAL SEAM LOG
- SEAMING LOG

88103907

Woodward-Clyde Consultants

PANEL PLACEMENT LOG

PROJECT NAME: Beth / NJ - USE, wash PAD

PROJECT NO.: 90N312IC

DATE / TIME	PANEL #	ROLL #	LOT # BATCH	REPAIRS YES / NO	REPAIRED	TESTED	AREA L / W	±SQ. FT.
12-12 PM	1	N.S.C. MATERIAL		NO	—	—	60/14.5	870
12-12 PM	2	✓	✓	✓	✓	✓	60	✓
12-12 PM	3	✓	✓	✓	✓	✓	60	✓
12-12 PM	4	✓	✓	✓	✓	✓	60	✓

COMMENTS:

THICKNESS

TOTAL	348
FR. SHT. #	—
ACCUM. TOTAL	348

CHK'D BY: [signature]

SIGNATURE: [signature]

8810390

PROJECT NAME: U.S. Ecology - Beatty NV. Wash Pad

EQUIP. TYPE: Fusion / Extrusion

PROJECT NO.: 90H3121C

SAMPLE # / DATE	TRIAL SEAM INFORMATION: EQUIP #	TECH	TIME	TEMP INF: AMB	SHEET				TIME	TEST RESULTS: PEEL #/BRK	P/F	SHEAR #/BRK	P/F	MILS
1 / 12-12	634E	IJ	PM	47	52	300			PM	110/100	P	145/145	P	40
1 / 12-13	2450E	IJ	AM	52	55	470	450		AM	75/80	P	140/140	P	40
1 / 12-17	04E	IJ	AM	43	52	460	500		AM	85/95	P	125/120	P	40
1 / 1-17-91	2330E	IJ	PM	55	62	455	500		PM	110/100	P	135/120	P	40
1 / 1-18-91	2330E	IJ	AM	47	52	450	500		AM	90/95	P	120/125	P	40
2 / 1-18	2330E	IJ	PM	55	62	450	500		PM	95/110	P	130/135	P	40
1 / 1-19	2330E	IJ	AM	48	51	485	500		AM	95/100	P	125/130	P	40
2 / 1-19	2330E	IJ	PM	58	65	485	500		PM	105/90	P	140/130	P	40

CHK'D BY: [signature]

SIGNATURE: [signature]

8810390

PROJECT NAME: BUS Ecology - Beatty NV. Wash PAD PROJECT NO.: 90H3121C

SEAM #	TACK'D	SEAM'D	EQUIP. #	TECH.	TEMP. SHEET	TEMP. AMB	WIND	TEST TYPE*	REPAIRS Y/N	REPAIRS #	REPAIRS REP'D/TEST'D	DESTRUCTIVE SAMPLE #	DESTRUCTIVE SAMPLE REP'D/TEST	LENGTH FT.
1/2	—	—	634	IJ	52	47	M	AP	Y	1	12-13-90	—	—	60
2/3	—	—	634	IJ	52	47	M	AP	Y	1	12-13-90	—	—	60
3/4	—	—	634	IJ	52	47	M	AP	N		—	—	—	60

COMMENTS:

TOTAL	180
FR SHT #	—
ACCUM. TOTAL	180

* V-VACUUM, S-SPARK, AP-AIR PRESSURE, VI-VISUAL, I-IMPACT, AL-AIR LANCE

CHK'D BY: [signature] SIGNATURE: [signature]

88103905

Woodward-Clyde Consultants

PROJECT NAME: BeAtty - U.S. Ecology

PROJECT NO. 90H3821C - WASHPAD

CLIENT: U.S. Ecology

DATE 12-12-92

DAY AM/PM: S M T W Th ... (X at W)

WEATHER	Snow	Clear	Brite Sun	Overcast X	Fog
TEMP.	To 32	32–50 PM	50–70	70–85	85–90
WIND	Still X		Moder	High	Report No. 1
HUMIDITY	Dry		Moder X	Humid	

TRIAL SEAMS

SAMPLE #	EQUIP # / TYPE	TECH	TIME	TEMP INF AMB	SHEET			TIME	PEEL #/BRK	P/F	SHEAR #/BRK	P/F
1	634 / F	I.J.	PM	47	52	360		PM	FTB/110	P	FTB/105	P
									" 100	P	"/105	P

PANEL PLACEMENT

TIME	TEMP	PANEL #	ROLL #	LOT # BATCH	REPAIRS Y/N	#	REPAIRED	TESTED	AREA L / W	± SQ
PM	47	1	N.S.C. Material		N				60/25	
"	"	2			"				"	
"	"	3			"				"	
"	"	4			"				"	

THICKNESS — TOTAL

WASHPAD

SEAMING

SEAM #	TACK'D	SEAM'D	EQUIP #	TECH	TEMP SHEET	AMB	WIND	TEST. TYPE*	REPAIRS Y/N	#	REP'D/TEST'D	DESTRUCTIVE SAMPLE #	REP'D/TEST
1-2			634	IJ	52	47	5	A.P	N				
2-3			"	"	52	"	"	"	N				
3-4			"	"	"	"	"	"	N				

* V-VACUUM, S-SPARK, AP-AIR PRESSURE, I-IMPACT, AL-AIRLANCE, VI-VISUAL — TOTAL

CHK'D BY: [signature] SIGNATURE: [signature]

88103905

Woodward-Clyde Consultants

PROJECT NAME: U.S. Ecology - Beatty NV.

PROJECT NO. 90H3121C - WASH PAD

CLIENT: U.S. Ecology

DATE 12-13-90

DAY AM PM

WEATHER	Snow	Clear	Brite Sun	Overcast	Fog	R
		X				
TEMP.	To 32	32-50	50-70	70-85	85-90	9
		Am				
WIND	Still		Moder	High	Report No.	
	X				2	
HUMIDITY	Dry		Moder	Humid		
	(					

TRIAL SEAMS

SAMPLE #	TRIAL SEAM INFORMATION: EQUIP # / TYPE	TECH	TIME	TEMP INF: AMB	SHEET	D	P.H.	TIME	TEST RESULTS: PEEL #/BRK	PEEL P/F	SHEAR #/BRK	SHEAR P/F
1	24 ~~00~~ / EX	IJ	Am	52	55	470	450	Am	FT3/75	P	FTB-100	P
									11 / 80	11	11	11

PANEL PLACEMENT

TIME	TEMP	PANEL #	ROLL #	LOT # BATCH	REPAIRS Y/N	#	REPAIRED	TESTED	AREA L / W	± SQ.
		1	N.S.C							
		2								
		3								
		4								

THICKNESS   TOTAL

SEAMING

SEAM #	TACK'D	SEAM'D	EQUIP #	TECH	TEMP SHEET	AMB	WIND	TEST. TYPE*	REPAIRS Y/N	#	REP'D/TEST'D	DESTRUCTIVE SAMPLE #	REP'D/TEST	LO

* V-VACUUM, S-SPARK, AP-AIR PRESSURE, I-IMPACT, AL-AIRLANCE, VI-VISUAL   TOTAL

CHK'D BY: [signature]   SIGNATURE: [signature] for S.B.

88103905

Woodward-Clyde Consultants

PROJECT NAME: US Ecology Beatty N.V.

PROJECT NO. 90H3121C - WASH PAD

CLIENT: U.S. Ecology

DATE 12-17-90

DAY AM/PM: S M T W Th F — X (M)

WEATHER	Snow	Clear X	Brite Sun	Overcast	Fog	Rai
TEMP.	To 32	32–50 PM-fn	50–70	70–85	85–90	90–
WIND	Still		Moder	High X	Report No.	
HUMIDITY	Dry X		Moder	Humid	3	

TRIAL SEAMS

SAMPLE #	EQUIP # / TYPE	TECH	TIME	TEMP INF AMB	SHEET			TIME	PEEL #/BRK	PEEL P/F	SHEAR #/BRK	SHEAR P/F	MI
1	04 EV	IJ	AM	43	52	460	500	AM	85/55	P	125	P	4c

PANEL PLACEMENT

TIME	TEMP	PANEL #	ROLL #	LOT # BATCH	REPAIRS Y/N	#	REPAIRED	TESTED	AREA L / W	± SQ. F

THICKNESS

TOTAL

SEAMING

SEAM #	TACK'D	SEAM'D	EQUIP #	TECH	TEMP SHEET	TEMP AMB	WIND	TEST. TYPE*	REPAIRS Y/N	#	REP'D/TEST'D	DESTRUCTIVE SAMPLE #	REP'D/TEST	LENGTH FT.

* V–VACUUM, S–SPARK, AP–AIR PRESSURE, I–IMPACT, AL–AIRLANCE, VI–VISUAL

TOTAL

CHK'D BY: [signature]

SIGNATURE: [signature] for S.D.

88103910

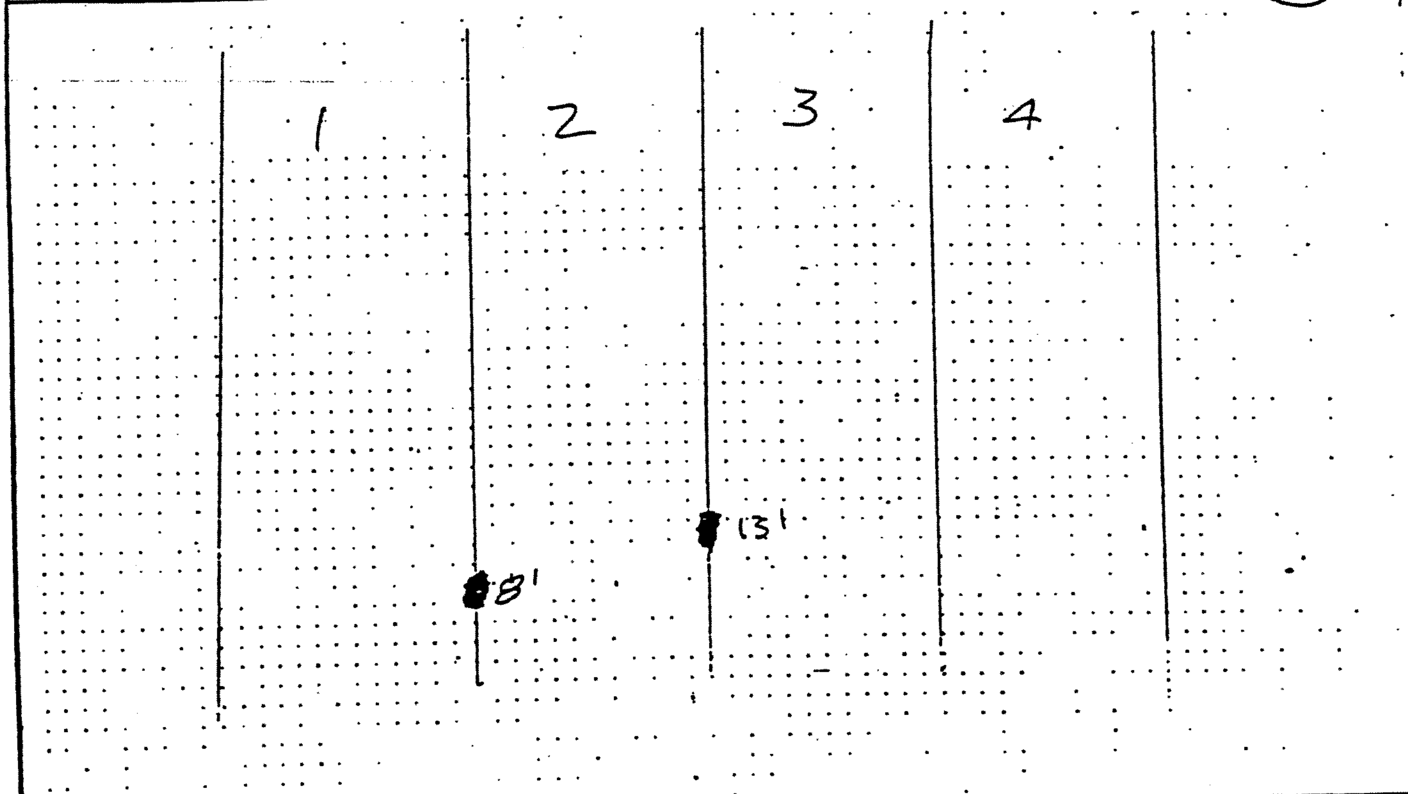
SHEET ______ OF ______

Woodward-Clyde Consultants

PANEL/SEAM DESCRIPTION

PROJECT NAME: U.S. Ecology - WASH PAD   PROJECT NO.: 90H3121C

▭	CAP/SAMPLE	⊠	REPAIRED	▬	TESTED	DATE:
○	PATCH	⊗	REPAIRED	●	TESTED	



PANEL PLACEMENT

TIME	PANEL #	ROLL #	LOT # BATCH	REPAIRS Y/N	REPAIRS #	REPAIRS REPAIRED	REPAIRS TESTED	AREA L / W	AREA ± SQ. FT.
								TOTAL	

SEAMING

SEAM #	TACK'D	SEAM'D	EQUIP. #	TECH.	TEMP. SHEET	TEMP. AMB	WIND	TEST TYPE*	REPAIRS Y/N	REPAIRS #	REPAIRS REP'D/TEST'D	DESTRUCTIVE SAMPLE #	DESTRUCTIVE SAMPLE REP'D/TEST	LENGTH FT.
													TOTAL	

* V-VACUUM, S-SPARK, AP-AIR PRESSURE, VI-VISUAL, I-IMPACT, AL-AIRLANCE

CHK'D BY: [signature]   SIGNATURE: [signature] for E.D.

APPENDIX D

(REMOVED)

APPENDIX E

BATCH STABILIZATION UNITS INTEGRITY ASSESSMENT REPORT

UPGRADE OF EXISTING
BATCH STABILIZATION UNIT

U.S. ECOLOGY, INC.
BEATTY, NEVADA
NDEP Permit HW0011
Revision 0

March 1998

PROFESSIONAL ENGINEER-STATE OF NEVADA
GRANT A.
JACKSON
CIVIL
No. 10299

03-23-1998

Prepared By

NAISMITH ENGINEERING, INC.
ENGINEERING • ENVIRONMENTAL • SURVEYING
CORPUS CHRISTI, TEXAS

NEI PROJECT NO: 4856

TABLE OF CONTENTS

1. GENERAL:

Naismith Engineering, Inc., (NEI) was retained by U.S. Ecology, Inc., (USE) to perform the construction quality assurance (CQA) for the upgrade of the existing bulk stabilization unit (BSU), located at their Beatty, Nevada facility. Golder Construction Services, Inc. (GCS) was retained by NEI to perform third party certification for the BSU. Facility operations are governed by two (2) separate authorizations. The facility is authorized to manage hazardous wastes regulated by the Resource Conservation and Recovery Act (RCRA) under a permit (Permit No. NEV-HW0011) [Ref. 1] issued by the Nevada Department of Conservation and Natural Resources, Division of Environmental Protection (NDEP). The facility is also authorized to manage toxic substances regulated by the Toxic Substances Control Act (TSCA) under an approval issued by the U.S. Environmental Protection Agency, Region IX.

2. FACILITY DESCRIPTION:

The facility is located in Nye County, near Beatty, Nevada. It is authorized to treat, store and dispose of certain types of hazardous and toxic wastes. The bulk storage unit is designed for the mechanical solidification and/or stabilization of hazardous wastes and for debris treatment. The existing BSU was converted into secondary containment for the new primary containment unit. The converted secondary containment unit is approximately fifty (50) feet long and approximately thirteen (13) feet wide. The new primary containment unit is a welded steel tank fabricated from one (1) inch thick steel plates and standard structural steel members. The primary containment unit is approximately forty-nine (49) feet long and approximately twelve (12) feet wide. A sump is provided on the east end of the secondary containment unit. There are two (2) four (4) inch diameter steel pipes in the sump for liquid removal from the secondary containment unit. The bottom of the secondary containment unit was sloped to drain to the sumps. A (1/4) inch thick steel pan surrounds the BSU on the north and east sides to provide containment for loading/unloading and support activities. The steel pan is sloped to drain liquids to the sump in the northeast corner. Gravel and sand separated by a geotextile was placed above the containment pan and graded to prevent the runoff of liquids. The as-built drawings and revised calculations are in Appendix A.

3. DESCRIPTION OF BATCH STABILIZATION UNIT MODIFICATION

3.1. Reason for Modification:

The previous batch stabilization tank was modified as per requirements of Permit No. NEV-HW0011, Section V.B.3.a.

3.2. Modification Procedure:

The existing unit was initially cleaned out, walls straightened, and "touch-up" welding was performed. The unit was visually inspected after the welding was complete and then hydrostatically tested. The hydrostatic testing results of the secondary containment unit on January 21, 1998 are presented in Appendix B.

The north and south walls of the existing BSU were squared up with new (1/2) inch steel plating supported by (¼) inch steel plating. The gap between the existing steel walls and the new (1/2) inch steel plating was filled with a cement mixture. Two (4) inch steel pipes were placed on the east side of the secondary containment unit for liquid removal.

The primary containment unit was prefabricated in sections and then constructed inside the modified secondary containment unit. Below the floor and on the east 9.3 feet of the 1 inch thick steel primary tank is 3" x 3" x 1/2" steel angles on 5 inch centers for reinforcement. The rest of the new 1 inch thick primary tank was reinforced with 3" x 3" x 1/2" steel angles on 8 inch centers. The unit was visually inspected and hydrostatically tested. The hydrostatic testing results of the primary containment unit on January 27, 1998 is in Appendix B.

3.3. Personnel Making Modification:

The modification to the Batch Stabilization Unit was completed by U.S. Ecology, Inc., site maintenance personnel.

3.4. Construction Quality Assurance for the Modification:

CQA personnel inspected and tested the modifications to the secondary containment system following fabrication. Inspections were made to ensure that the fabrication was performed properly. In addition, a hydrostatic test was performed on the completed installation of the primary and secondary system. An inspection report and the results of the hydrostatic test are included in Appendix B. All inspections and test indicated that the lining system was functioning properly and was acceptable. Ms. Laurie Sanders of the Nevada Division of Environmental Protection (NDEP) was on site January 26, 1998 to observe the construction of the modified batch stabilization unit.

A letter certifying the proper construction of the Batch Stabilization Unit has been included in Appendix C.

3.5. CQA Personnel:

On-site CQA activities and CQA oversight were provided by Mr. Richard E. Kiel, P.E. of Golder Construction Services. Mr. Kiel is a registered professional engineer in the state of Nevada and is experienced in CQA activities for hazardous waste management facilities.

4. REFERENCES

1. "Nevada Division of Environmental Protection Permit for Hazardous Waste Treatment, Storage and Disposal", Nevada Division of Environmental Protection, Carson City, Nevada, July, 1988.

2. "Part B Renewal for Hazardous Waste Management Facility - U.S. Ecology, Inc., Beatty, Nevada", Volumes I through VI, U.S. Ecology, Inc., Houston, Texas, April, 1997, Revision 0.

D:\4856\BSUREPORT.DOC

APPENDIX A

AS-BUILT DRAWINGS
AND
REVISED CALCULATIONS

UPGRADE OF EXISTING BATCH STABILIZATION UNIT
U.S. ECOLOGY, INC., BEATTY, NEVADA
NDEP Permit No. HW0011

REVISED CALCULATIONS

Revision 0

March 6, 1998

JOB NO. 4856
DESCRIPTION:

NAISMITH ENGINEERING, INC.
CALCULATIONS - BATCH STABILIZATION UNIT
REVISED DESIGN FOR DOUBLE WALLED STEEL

SHEET NO. 1
DATE: 2/23/98

OBJECTIVE: To determine, through established and structural steel design procedures, the required structural steel dimensions/member sizes of the several proposed batch stabilization unit (BSU) system components.

APPROACH:

1. Perform analysis and design according to established structural and foundation engineering standards, ACI 318-89.

2. Where applicable, static and dynamic loads have been combined to develop "worst case scenerio" loading conditions.

GIVEN:

1. The site is located in a seismic zone 3, according to the 1994 Uniform Building Code.

2. The proposed BSU as shown in the design drawings given in Appendix A of this report.

ASSUMPTIONS:

1. All structural steel will have a minimum yield strength, f_y, of 36,000 psi [A36 carbon steel].

CALCULATIONS:

Step 1. Structural steel mixing tank

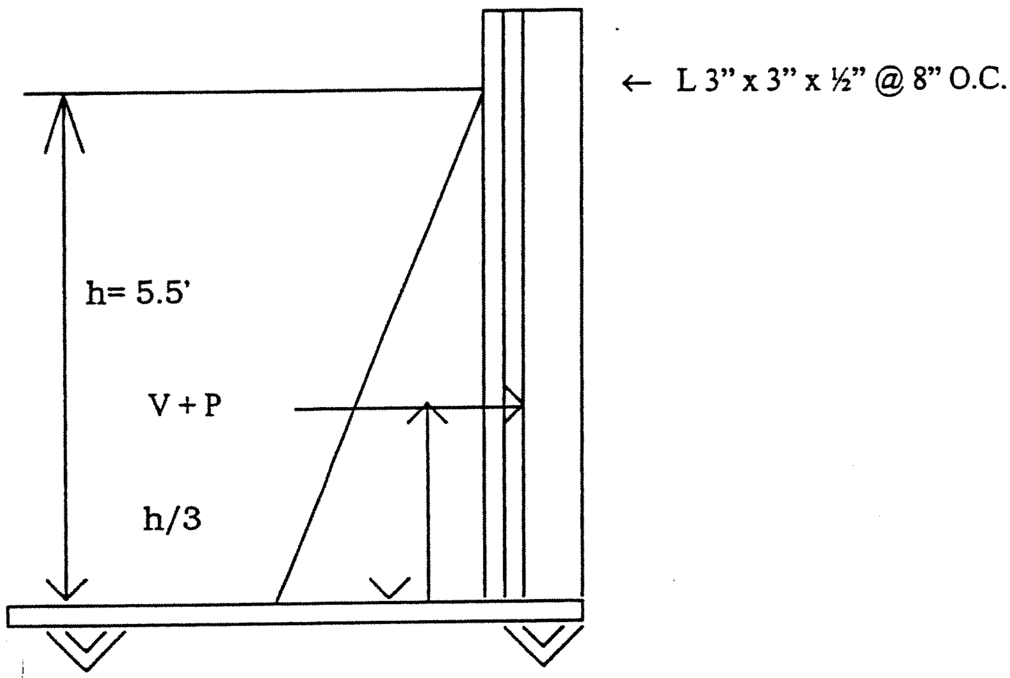
The tank will rest inside a containment tank constructed with 1/2 inch steel plate which rests on grade.

A. Size Wall Stiffeners - The governing loading condition is created by earth pressure on the walls.

3 Pages of Calculations

PROFESSIONAL ENGINEER - STATE OF NEVADA
GRANT A. JACKSON
CIVIL
No. 10299

03-23-1998



WALL DESIGN (Assume Ø = 45° for Substrate)

P = FORCE DUE TO DEAD LOAD OF SUBSTRATE

$P = \frac{1}{2}\gamma h^2 \tan^2(45 - Ø/2) = 1/2\ (100\ \text{pcf})\ 5.5 \tan^2(45\text{-}45/2) = 259\ ^{lb}/_{ft}$.

INFLUENCE FROM ZONE III SEISMIC (PER UBC 1994)

$$V = \frac{(ZIC)}{RW} P = \frac{[(0.30)(1.25)(8.2)]}{6}\, 259 = 133\ ^{lb}/_{ft} < P$$

- $Z = 0.30$ (Table 16 - I UBC 94)
- $I = 1.25$ (Table 16-K UBC 94)
- $C = 1.25\ S/T^{2/3} = 1.25\ (1.0)/(0.06)^{2/3} = 8.2$

  - $S = 1.0$ (Table 15-J, UBC 94)
  - $T = C+(hn)^{3/4} = 0.035\ (5.5/3)^{3/4} = 0.06$

- $Rw = 6$ (Table 16-N UBC 1994)

MOMENT AT BASE

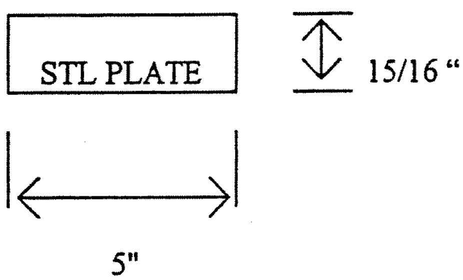
$$M_1 = (259 + 133\ ^{lb}/_{ft})\ \frac{5.5}{3} = 719\ \text{lb.ft}\ (0.719\ \text{k.ft})$$

$M_{allow.}$ = fb5x = (24ksi)(4.87 in^3) 1/12 = 9.74 k.ft>M_1 ok

- fb = 24 ksi (AISC 9^{th})
- Sx = I/y = 18.9 in^4/(5.0 - 1.12) = 4.87 in^3

BASE (FLAT PLATE) DESIGN

1" STEEL PLATE WITH A 1/16" LOSS ON INTERIOR (ONE SIDE) DUE TO CORROSION

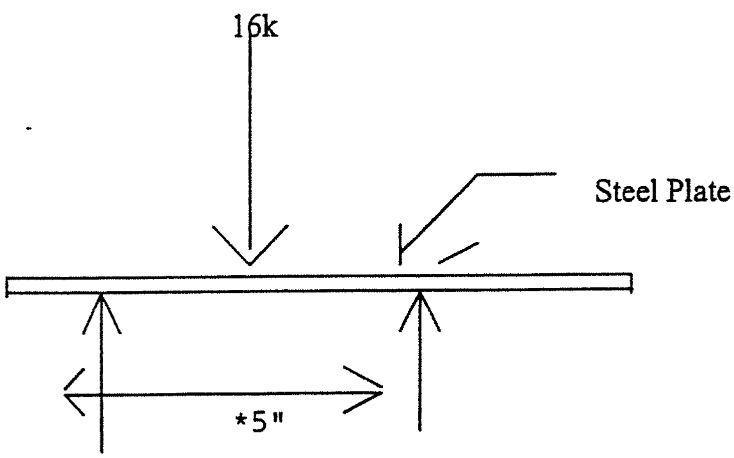


- Sx = 1/6 bh^2 = 1/6(5")(15/16")^2 = 0.73 in^3

M_{allow} = (24 ksi)(.73 in^3) 1/12 = 1.46 k.ft >M_1 OK

MOMENT IN STEEL PLATE DUE TO HS20 TRUCK LOADING

HS 20 WHEEL LOAD = 16 kips



Continuity Factor

$_1$ = PL/4 = (16k)(5/12*0.80)/4 = 1.33k.ft < M_{allow} OK

*This analysis is extremely conservative since a typical tire will bear on at least three 3"x3"x1/2" steel angles.

JOB NO. 4856
DESCRIPTION:

NAISMITH ENGINEERING, INC.
CALCULATIONS - STABILIZATION UNIT
SECONDARY CONTAINMENT VOLUME

SHEET NO. 1
DATE: JANUARY 1998

<u>OBJECTIVE</u>: To show that the containment volume within the confines of the secondary containment tank will meet the requirements from 40 CFR §264.193.

<u>APPROACH</u>: Determine the required volume of containment according to 40 CFR §264.193, which requires that the secondary containment be able to contain one hundred percent (100%) of the capacity of the largest tank within its boundary, plus the precipitation resulting from a 25-year, 24-hour rainfall event.

<u>ASSUMPTION</u>: The secondary containment will be sealed to prevent the collection of precipitation. Therefore, the secondary containment needs only to be sized to contain the volume of the primary tank.

<u>CALCULATIONS</u>:

Step 1 Calculate the maximum capacity of each steel mixing tank.

The maximum capacity of each tank, V_{tank}, is the sum of the volume above the flat bottomed area, V_{fb}, and the volume above the ramped area, V_r.

$$V_{tank} = V_{fb} + V_r = 29.3 \text{ ft } (12.1 \text{ ft})(1.8\text{ft}) + .5(20 \text{ ft})(12.1\text{ft})(1.8\text{ft})$$

$$= \underline{856 \text{ ft}^3}$$

Step 2 Calculate the volume of the secondary containment unit. It is approximately 2-1/2" deeper and 7" wider than the primary containment unit.

$$V_{tank} = V_{fb} + V_r = (29.5\text{ft})(12.7\text{ft})(1.8\text{ft}) + .5(20\text{ft})(12.7\text{ft})(1.8\text{ft})$$

$$= \underline{903 \text{ ft}^3}$$

Therefore, the secondary containment is adequate for containing 100% of the primary containment unit. Since the sides of the units are at the same elevation, this intuitively checks.

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PROFESSIONAL ENGINEER - STATE OF NEVADA
GRANT A. JACKSON
CIVIL
No. 10299

03-23-1998

APPENDIX B

CONSTRUCTION QUALITY ASSURANCE DOCUMENTATION

NAISMITH ENGINEERING, INC.
PROJECT INSPECTION REPORT

Project Title: Upgrade of Existing BSU	
Owner: U.S. Ecology, Inc. - Beatty, NV (American Ecology)	
Owner's Project No.:	NEI Project No.: 4856

Date: 1-21-98	Time: 0700	Page 1 of __
Contractor: N/A	Type of inspection: ☐ daily ☒ periodic	
Inspector(s): David C. McCormick	Persons contacted on-site: Lori Taguchi (Technical Reviewer)	
Weather: Low 50's, clear, calm	Testing in progress: Inspection - Hydrostatic test	
Contractor: ☐ working ☐ delayed (weather) ☐ delayed due to N/A		

Work in progress:
Preparation for hydrotest of the existing mixing tank.
Hydrotest
- inspected welding - no visible gaps or holes.
- did not notice any bubbling or loss of water.

Work completed since last inspection:
N/A - First inspection

Equipment/materials received on-site since last inspection:
Received steel plating

Summary:
0700 Arrived on site
0730 Health and Safety orientation
0800 Monitoring repair work to existing mixing tank and preparations for BSU upgrades.
1200 Inspected mixing tank with Ms. Taguchi (USE)
1230 Began Hydrotest
1505 Departed site

(Attach additional sheets as required)

Signature of inspector(s): [signature]

Distribution:

E:\PROJMAN\INSP.FRM REVISED 08-30-94

Test Parameters
The Batch Stabilization Secondary Containment Unit is filled with water in a hydrostatic test. A plastic pan is also filled with water, to allow the test to account for water loss due to evaporation. Water level measurements are made in both units throughout the test period. Dimensions of the secondary containment unit are 49'-4" long, by 13'-7" wide, by approximately 5'-8" deep. The diameter of the plastic control pan is 11". All times are Pacific Standard Time. An initial mark was made on both units and all level measurements were made from this mark. This test was performed on January 21, 1998.

WATER LEVEL MEASUREMENTS OVER TIME			
Time	Pan Level (In.)	Wash Pad Level (In.)	Comments
12:20	1.0	1.0	Initial
12:35	1.0	1.0	No Loss
12:50	1.0	1.0	"
1:20	1.0	1.0	"
1:50	1.0	1.0	"
2:50	1.0	1.0	"

<u>Pan Calculations</u>
Area: $(\pi/4) \times (11\text{ in})^2 = 95.0\text{ in}^2 \times (1\text{ ft}^2/144\text{ in}^2) = 0.65\text{ ft}^2$
Volume lost: $0.0\text{ in} \times 95.0\text{ in}^2 = 0.0\text{ in}^3 \times (1\text{ ft}^3/1{,}728\text{ in}^3) = 0.00\text{ ft}^3$
Evaporation Rate: $0.00\text{ ft}^3/0.65\text{ ft}^2 = 0.00\text{ ft}^3/\text{ft}^2$

<u>Secondary Batch Stabilization Unit Calculations</u>
Area: (filled to middle of ramp) $39.3\text{ ft} \times 13.6\text{ ft} = 534.5\text{ ft}^2$
Actual Loss: $534.5\text{ ft}^2 \times 0.0\text{ in} \times (1\text{ ft}/12\text{ in}) = 0.0\text{ ft}^3$

CONCLUSION: Since there was no recordable loss in the existing batch stabilization unit, the system did not leak and passed hydrostatic test

NAISMITH ENGINEERING, INC.
PROJECT INSPECTION REPORT

Project Title: Upgrade of Existing BSU	
Owner: U.S. Ecology, Inc. - Beatty, NV (American Ecology)	
Owner's Project No.:	NEI Project No.: 4856

Date: 1-26-98	Time: 0800	Page 1 of __
Contractor: N/A	Type of inspection: ☐ daily ☐ periodic	
Inspector(s): David McCormick (NEI) Rick Kiel, P.E.	Persons contacted on-site: Lori Taguchi - Technical Reviewer	
Weather: Low 50's, clear, calm	Testing in progress:	
Contractor: ☐ working ☐ delayed (weather) ☐ delayed due to N/A	Inspection - Hydrostatic Test	

Work in progress:
Preparation for hydrotest of the primary mixing tank.

Work completed since last inspection:
Modified existing tank, sealed previous secondary system, constructed exterior pan.

Equipment/materials received on-site since last inspection:
N/A

Summary:
0800 Arrived on site with Rick Kiel, P.E.
0830 Rick Kiel went through Health and Safety orientation.
0900 Performed inspection of BSU and extior pan while US. Ecology was performing modifications.
09.15 Laurie Sanders (DNCR) - Env. Management Specialist II
1500 Departed site, US Ecology expects to complete BSU by late afternoon or early next morning.

(Attach additional sheets as required)

Signature of inspector(s): [signature]

Distribution:

NAISMITH ENGINEERING, INC.
PROJECT INSPECTION REPORT

Project Title: Upgrade of Existing BSU	
Owner: U.S. Ecology, Inc. - Beatty, NV (American Ecology)	
Owner's Project No.:	NEI Project No.: 4856

Date: 1-27-98	Time: 0800	Page 1 of 2
Contractor: N/A	Type of inspection: ☐ daily ☐ periodic	
Inspector(s): David McCormick (NEI) Rick Kiel, P.E. (GCS)	Persons contacted on-site: Lori Taguchi - Technical Reviewer	
Weather: Low 50's, clear, calm	Testing in progress: Inspection - Hydrostatic Test	
Contractor: ☐ working ☐ delayed (weather) ☐ delayed due to N/A		

Work in progress:

Preparation for hydrotest of the primary mixing tank.

Work completed since last inspection:

Continue construction of Primary unit and exterior pan

Equipment/materials received on-site since last inspection:

N/A

Summary:

0800 Arrived on site with Rick Kiel, P.E.
(informed U.S. Ecology ran out of welding rod last night and drove to Las Vegas to purchase more).

2:30 pm Completed primary unit, began visual insp. and then performed the hydrotest. (Loss of 1/4"/15 min. in Secondary Sump).

3:30 pm Began pumping water out of primary tank in order to perform repairs on leaks.

(Attach additional sheets as required)

Signature of inspector(s): [signature]

Distribution:

E:\PROJMAN\INSP.FRM REVISED 08-30-94

NAISMITH ENGINEERING, INC.
PROJECT INSPECTION REPORT

Project Title: Upgrade of Existing BSU	
Owner: U.S. Ecology, Inc. - Beatty, NV (American Ecology)	
Owner's Project No.:	NEI Project No.: 4856

Date: 1-27-98	Time: 0800	Page 2 of 2
Contractor: N/A	Type of inspection: ☐ daily ☐ periodic	
Inspector(s): David McCormick, P.E (NEI) Rick Kiel, P.E. (GCS)	Persons contacted on-site: Lori Taguchi - Technical Reviewer	
Weather: Low 50's, clear, calm	Testing in progress: Inspection - Hydrostatic Test	
Contractor: ☐ working ☐ delayed (weather) ☐ delayed due to N/A		

Work in progress:

Preparation for hydrotest of the primary mixing tank.

Work completed since last inspection:

Continue construction of Primary unit and exterior pan.

Equipment/materials received on-site since last inspection:

N/A

Summary: (Continue from P. 1)

9:45pm finished repairs and began hydrotest (filled secondary)
10:00 pm Found 3 pinhole leaks (drained, dried, repaired leaks).
10:20 pm began hydrotest (filled secondary)
No leaks found in Primary
11:50 pm No loss in secondary.

(Attach additional sheets as required)

Signature of inspector(s): David McCormick

Distribution:

Test Parameters
The Batch Stabilization Primary Containment Unit is filled with water in a hydrostatic test. Water level measurements were made in the secondary sump throughout the test period. All times are Pacific Standard Time. A rod was used to measure the depth of water in the secondary sump pipe located in the northeast corner. This test was performed on January 27, 1998.

WATER LEVEL MEASUREMENTS OVER TIME		
Time	Secondary Sump (In.)	Comments
2:30 pm	0	Initial
2:45 pm	.25	Gain in Secondary
3:00 pm	.25	"Gain in Secondary
		Drained, Dried, Locating Leaks
		"
10:00 pm	19-7/8	Filled Secondary Sump
		Found 3 pinhole leaks on West Side
10:20 pm	19-7/8	Filled Secondary Sump after repairs
10:40 pm	19-7/8	No Loss
11:00 pm	19-7/8	No Loss
11:50 pm	19-7/8	No Loss

CONCLUSION: Since there was no recordable loss in the secondary sump and no visible losses in the batch stabilization primary unit, the system did not leak after final repairs to the primary and passed hydrostatic test

APPENDIX C

CERTIFICATION LETTER

Golder Construction Services, Inc.
Quality Assurance and Construction Management

February 6, 1998

Our Reference: 987-5124

Mr. Jeffrey C. Denison, P.E.
RCRA Facilities Branch Supervisor
Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, NV 89706

Re: **CERTIFICATION OF THE MODIFICATION TO THE BATCH STABILIZATION UNIT AT THE US ECOLOGY FACILITY NEAR BEATTY, NEVADA, UNDER NEVADA DIVISION OF ENVIRONMENTAL PROTECTION PERMIT NO. NEV-HW0011**

Dear Mr. Denison:

This letter is submitted to certify that the construction of the Batch Stabilization Tank has been completed and conforms with the tank system standards of 40 CFR Subpart J, including 40 CFR 264.192, as required by Section V.B.3.a of the Facility Permit (Nevada Division of Environmental Protection Permit No. NEV-HW0011). This certification applies to the facility only at the time of completion of the construction.

Mr. Rick Kiel, with Golder Construction Services, Inc. (GCS) and Mr. Dave McCormick, with Naismith Engineering, Inc. (Naismith) performed a site inspection on January 26 and 27, 1998, to provide an assessment of the integrity of the Batch Stabilization Unit (BSU) or Batch Stabilization Tank. In addition, a leak test was performed on January 27, 1998, to aid in this assessment in accordance with 40 CFR Subpart J - Tank Systems; Section 264.191 (b) (5).

The BSU was modified according to the "Revised Design for Double Walled Steel Batch Stabilization Unit," Revision 2, dated January 1998, by Naismith Engineering, Inc. and in accordance with additional field modifications deemed necessary. The modifications consisted of constructing a new primary containment unit inside the existing BSU, and converting the existing BSU to provide secondary containment. These modifications make the system capable of handling the hazardous wastes for which it was designed, without release for the intended life of the system.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

This certification will be followed by a report from Naismith (the Design Engineer) outlining the details of the work, and will include a complete set of as-built drawings.

If you should have any questions or need additional information, please feel free to contact us.

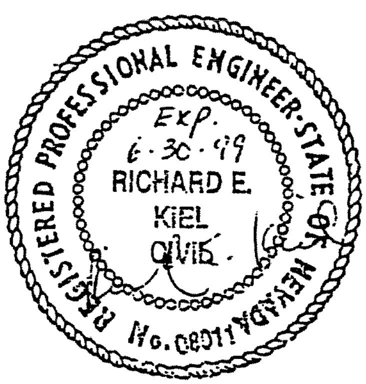
Sincerely,

GOLDER CONSTRUCTION SERVICES, INC.

Rick Kiel

Rick Kiel, P.E.
Senior Engineer

cc: Mr. Grant Jackson, P.E., Naismith Engineering, Inc., Corpus Christi, Texas
Mr. Zaki Naser, General Manager, US Ecology, Inc., Beatty, Nevada
Ms. Lori Taguchi, Engineering Manager, US Ecology, Inc., Beatty, Nevada



DOUBLE-WALLED STEEL BATCH STABILIZATION UNIT AND REAGENT SILOS

US Ecology, Inc.

Hazardous Waste Management Facility

Beatty, Nevada

Prepared by

AquAeTer, Inc.

Englewood, CO

October 9, 2001

Each oft the two bays of the BSU ("pans") will be constructed in a similar fashion. Pan construction will have a primary and secondary containment system, constructed of one-inch thick welded steel plate with standard structural steel members. The slope of the floor of the primary containment of the pans will be toward the mixing unit; this will facilitate the mixing process, and prevent waste materials and precipitation that falls on the pans from migrating beyond the limits of the pans.

Separate sumps will be located inside the secondary containment structure of each pan, near the mixing unit. The slope of each secondary containment structure will be toward the respective sump. The sumps will be inspected daily for the presence of liquid within the secondary containment structure. A steel pipe will extend into the sump to allow the inspection and extraction of any liquid that accumulates within the secondary containment sump. The primary and secondary containment structures will be sealed (welded) to prevent the migration of surface liquid from outside of the primary or secondary containment structures into the sump. Both containment structures are constructed of one-inch thick welded steel plate.

The areas beneath the truck load out and mixing area surrounding the pans will be underlain with 1/4-inch thick steel plate covered with six inches of sacrificial soil and 12 inches of gravel. For a distance extending outwards 12 feet from the edge of the pans, a concrete layer will be placed over the soil to facilitate operations near the pan. For an additional 12 feet beyond that, the sacrificial soil will form the top layer. The entire 24-feet wide concrete and sacrificial soil areas will be underlain by ¼-inch thick steel plates sloped to drain to separate collection sumps.

The load out area is where the stabilized waste will be transferred from the pan to the transport truck that will transfer the stabilized waste to the landfill. The steel plate of the load-out pans will be sloped to two separate sumps for the removal of any liquid that may accumulate within the gravel above the steel plate. A surface berm of soil will be placed around the area to prevent the run-on of precipitation from entering the truck load out area. A drawing of the BSU is included in Appendix A.

4.0 BSU CONSTRUCTION

4.1 Construction Standards

The BSU will be used for the mixing of hazardous waste and debris with reagents and stabilizing material to allow the disposal of the mixed material in the landfill. The BSU is planned for use under atmosphereic pressure conditions to accommodate the mixing activities, including both the distributed load of the waste and reagents and the small impact loads anticipated from the mixing head. Experience gathered from the single pan BSU already located on site was incorporated into the design.

The secondary containment structures are designed to collect and drain liquids that pass through the primary walls of the pans into two separate sumps. Additionally, the steel pan underlying the surrounding load-out area includes two sumps installed to capture precipitation and surface water that may penetrate the sacrificial soil layer.

4.2 Tank Integrity Assessment

The integrity of the secondary containment structure was tested by filling each side of the BSU secondary containment structure with water and observing the pan interior for the presence of leaks. Water level in the two secondary containment structures was observed for level declines that could be caused by leaks that were not visible. The tank integrity test was performed before backfill was placed around the tank. As a result of the initial test, minor leaks were detected. These leaks were re-welded and re-tested to demonstrate integrity. Notes documenting the integrity of the secondary containment structure is included in Appendix B.

The secondary containment structures for the BSU consists of a redundant one-inch thick welded-steel plate tank surrounding the primary (interior) tanks. The secondary containment structure tank is attached to the primary tank, with separation provided by structural steel angles. The secondary containment structure is completely sealed to prevent the influx of surface water or precipitation. Therefore, the secondary containment structure only has to hold 100 percent of the contents of the primary (interior) tank. The spacing between the two tanks is about 4 inches on all sides, along the dividing wall, and beneath the tanks. Since the two tanks are joined at the top (same elevation), the space formed by the structural steel angles ensures the containment is sufficient, and no additional calculations are required to demonstrate containment volume.

4.3 Structural Strength

The steel BSU tanks and the concrete reagent silo foundation will be designed to withstand the governing loads imposed by the design seismic loading criteria for a seismic zone 3. The BSU tanks are buried in level ground, and are not subject to sliding or overturning by seismic activity.

A mixing head will be used to perform the stabilization process. If used carelessly or improperly, the mixing head may be capable of damaging the floor or walls of the tanks. However, routine inspection and prompt repair of damage should prevent failure of the unit from punctures. Additionally, the BSU has been reinforced, as compared to the existing on-site BSU by the use of thicker steel plate, which should also contribute to the durability of the unit.

4.4 Corrosion Protection

The steel components of the BSU are cathodically protected against corrosion by the use of one pound aluminum sacrificial anodes installed on the tank walls. One aluminum anode will be bolted to each wall of the exterior of the secondary containment structure. The primary containment unit is welded to the secondary containment unit, and is therefore, also protected. The aluminum anodes will be monitored for corrosion and replaxed as necessary.

4.5 Compatibility with Waste

The BSU could potentially be exposed to any of the waste streams handled at the facility, including inorganic aqueous liquids, organic liquids, water-based sludges, organic sludges, inorganic and organic solids. The primary wastes received for stabilzation at the facility will be organic and inorganic solids and sludges.

Highly reactive materials, and materials with a high pH or low pH represent the greatest potential for incompatibility with the steel tanks. The likelihood of chemical incompatibility between reactive, acidic, or alkaline wastes and the steel tanks is considered small due to the treatment reagents' tendance to quickly combine with the most reactive constituents in the waste, limiting their ability to further react with the tank material.

To further prevent the failure of the unit from incompatibility with the wastes, the BSU will be inspected routinely for signs of corrosion and structural failure. Any problems detected will be corrected prior to continuing stabilization operations. Routine cleaning operations between different waste types will remove waste residues remaining in the unit.

APPENDIX A

Batch Stabilization Diagram

APPENDIX B

Leak Integrity Assessment Notes

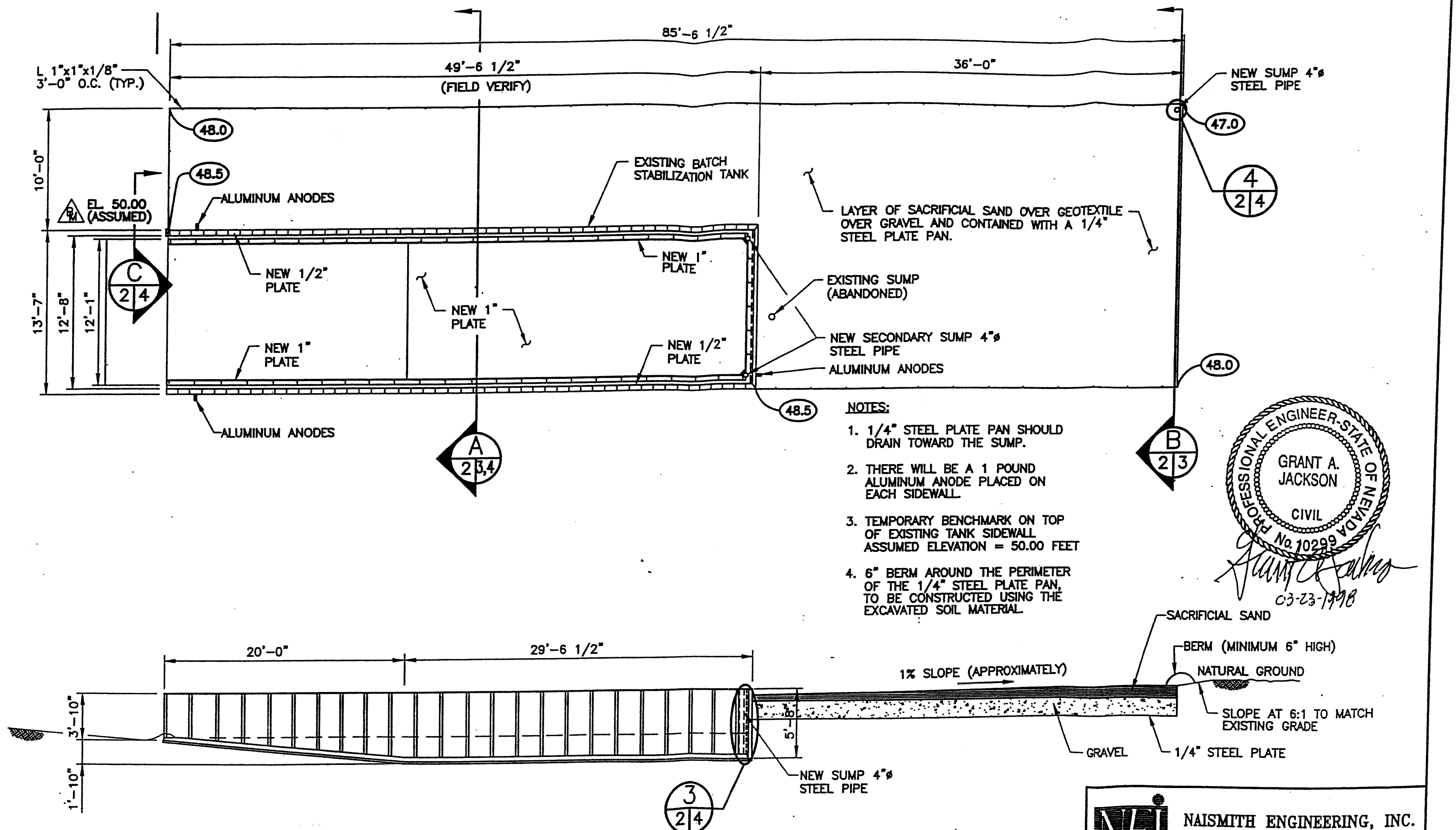
12-18-00

Hydro Test New PAN's
Start water in 7:40 Am
Water Started in West Side
7:55 West Side Full Visual
Check Found Leak in Cap
Mark for Repair - Found
Leak's in Center Wall Tie in
Check in Side Small seep on
Top Cap - ~~Started~~ Pumping
Out for Repair.
Start water in East Side
8:40 East Sid Full 09:00
Checking for Leak's Small Seep
on Second panel Cap out Side
Mark for repair One Small Seep
South west Corner mark for
Repair Start Pumping out
10:20Am water out 10:45 -
Start grinding out Repair
Area's Go to Lunch
Welding Repair

Continue Welding Repair areas
Complete Welding 10:20 Am
Start Water in 11:00 Am West
Side Full 11:25 Spilled water
on Floor inside and out Clean
out + dry Start WAter on
on East Side 11:45 Am Full
12:10 Am No Spill, Go to Lunch
Back 1:00pm No Visible Leak's
Water Standing Full

12-20-00

7:00Am Still No Leak's
Check out Side Grade for
Any moisture Check Floor
Weld's Start pumping out
10:45 Still Full Pump Both
West and East Side out
Still Reside water in Sump's



NOTES:

1. 1/4" STEEL PLATE PAN SHOULD DRAIN TOWARD THE SUMP.
2. THERE WILL BE A 1 POUND ALUMINUM ANODE PLACED ON EACH SIDEWALL.
3. TEMPORARY BENCHMARK ON TOP OF EXISTING TANK SIDEWALL ASSUMED ELEVATION = 50.00 FEET
4. 6" BERM AROUND THE PERIMETER OF THE 1/4" STEEL PLATE PAN, TO BE CONSTRUCTED USING THE EXCAVATED SOIL MATERIAL.

PLAN AND ELEVATION

SCALE: 1/8"=1'-0"

LEGEND

(48.5) BOTTOM OF 1/4" STEEL PLATE PAN ELEVATION

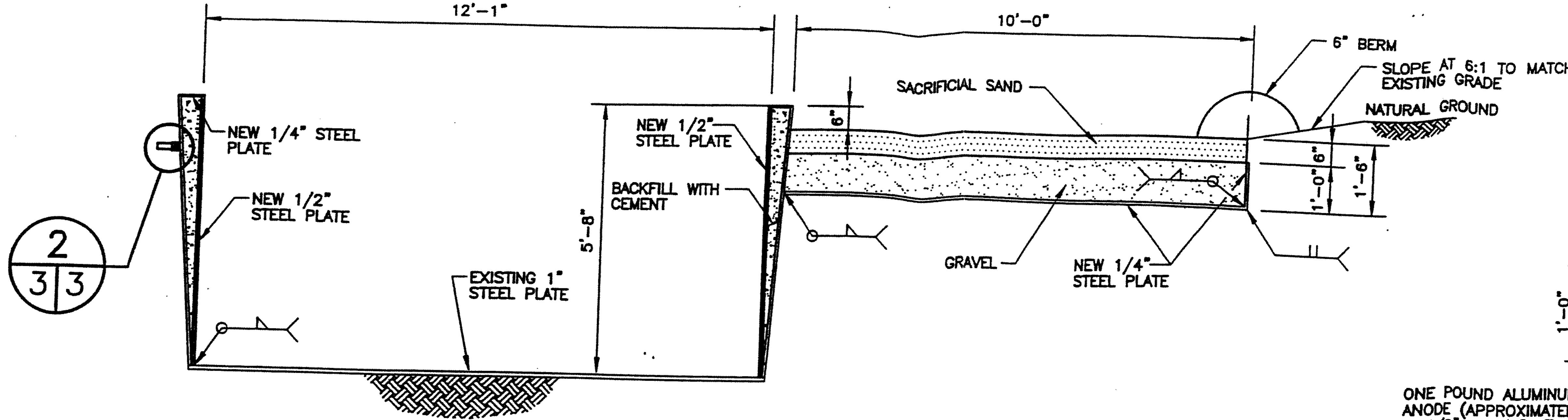
BM TEMPORARY BENCHMARK

REV.	REVISIONS	APPR.	DATE
1	EXISTING SUMP-ABANDONED	GAJ	12/97
2	AS-BUILT		

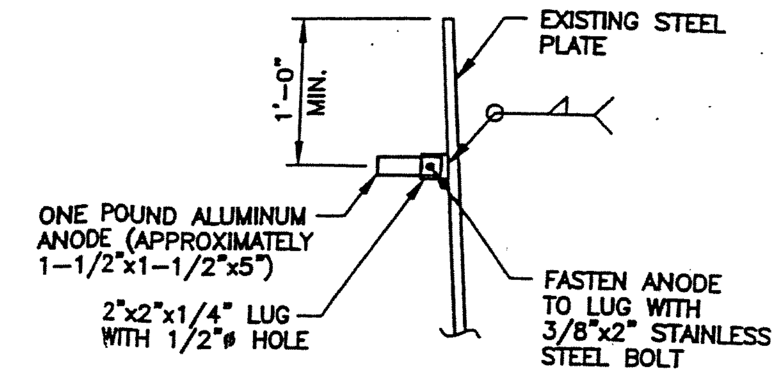
NAISMITH ENGINEERING, INC.
ENGINEERING • ENVIRONMENTAL • SURVEYING
CORPUS CHRISTI, TEXAS

PLAN AND ELEVATION
MODIFIED BATCH STABILIZATION UNIT
PERMIT No. NEV-HW0011
U.S. ECOLOGY, INC.
BEATTY, NEVADA

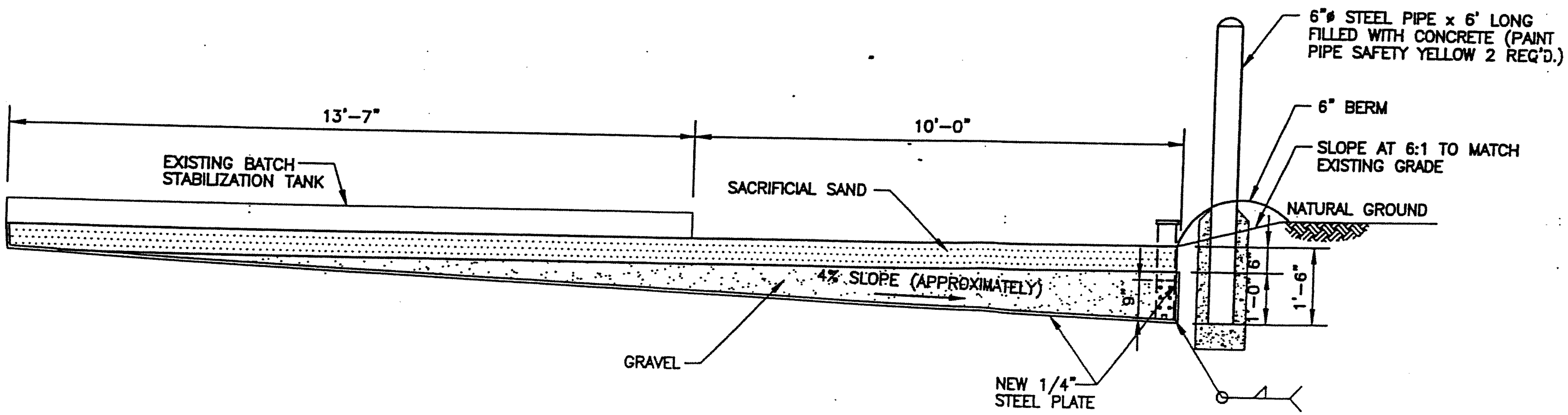
Drawn By: T.C.A	Appr. By: G.A.J	Scale: AS NOTED	Dwg. No.: 4856-S02	Sheet 2 of 4
Checked By: G.A.J	Project No.: 4856	Date: 12/97	Rev.: 2	



A 2|3 SECTION
MODIFICATION TO EXISTING BATCH STABILIZATION TANK
SCALE: 3/8"=1'-0"



2 3|3 DETAIL
SCALE: 3/4"=1'-0"



PROFESSIONAL ENGINEER - STATE OF NEVADA
GRANT A. JACKSON
CIVIL
No. 10299

03-23-1998

NOTES:

1. ALL STRUCTURAL MEMBERS AND PLATES TO BE ASTM A36 STEEL.
2. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE A.W.S. USING E70XX ELECTRODES.
3. ALL JOINTS SHALL BE CONTINUOUSLY WELDED WITH FILLET WELDS.
4. REMOVE ALL BURRS (GRINDING).

NOTES:

NEW 1/4" STEEL PLATE SECONDARY CONTAINMENT TO DRAIN TOWARD THE SUMP.

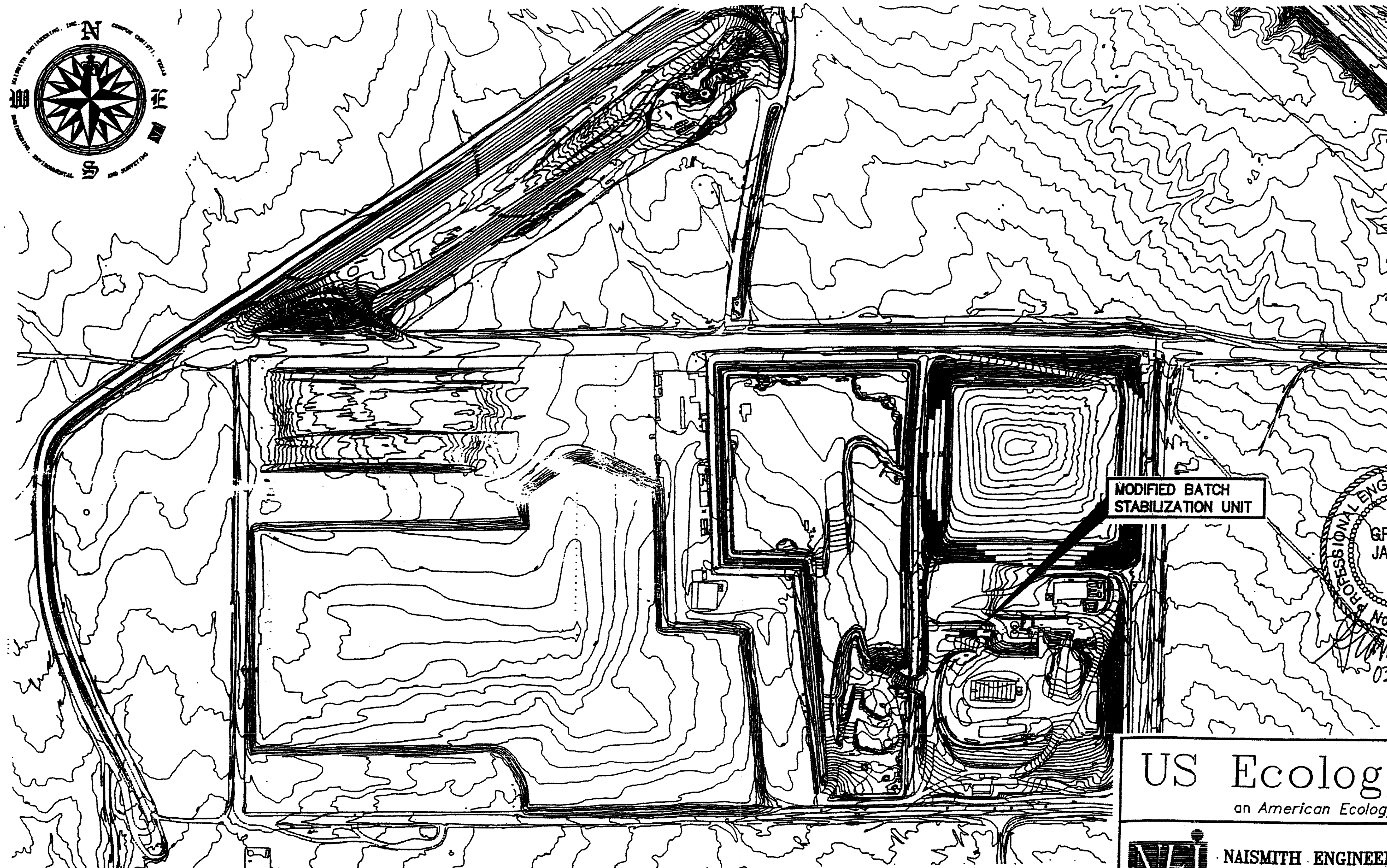
B 2|3 SECTION
MODIFICATION TO EXISTING BATCH STABILIZATION TANK
SCALE: 3/8"=1'-0"

REV.	REVISIONS	APPR.	DATE
1	FOR CONSTRUCTION	G.A.J	12/97
2	AS-BUILT		

NAISMITH ENGINEERING, INC.
ENGINEERING • ENVIRONMENTAL • SURVEYING
CORPUS CHRISTI, TEXAS

SECTIONS
MODIFIED BATCH STABILIZATION UNIT
PERMIT No. NEV-HW0011
U.S. ECOLOGY, INC.
BEATTY, NEVADA

Drawn By T.C.A	Appr. By G.A.J	Scale AS SHOWN	Dwg. No. 4856-S03	Sheet 3
Checked By G.A.J	Project No. 4856	Date 12/97	Rev. 2	of 4



300 0 300 600

GRAPHIC SCALE IN FEET

PROFESSIONAL ENGINEER-STATE OF NEVADA
GRANT A. JACKSON
CIVIL
No. 10299

03-23-1998

REV.	REVISIONS	APPR.	DATE
1	FOR CONSTRUCTION	G.A.J	12/97
2	AS-BUILT		

US Ecology

an *American Ecology* company

NAISMITH ENGINEERING, INC.
ENGINEERING • ENVIRONMENTAL • SURVEYING
CORPUS CHRISTI, TEXAS

SITE PLAN
MODIFIED BATCH STABILIZATION UNIT
PERMIT No. NEV-HW0011
U.S. ECOLOGY, INC.
BEATTY, NEVADA

Drawn By	T.C.A	Appr. By	G.A.J	Scale	AS NOTED	Dwg. File	4856-S01	Sheet	1
Checked By	G.A.J	Project No.	4856	Date	12/97	Rev.	2	of	2

DOUBLE-WALLED STEEL BATCH STABILIZATION UNIT

TANK INTEGRITY ASSESSMENT

US Ecology, Inc.

Hazardous Waste Management Facility

Beatty, Nevada

Prepared by

AquAeTer, Inc.

Englewood, CO

January 15, 2002

TABLE OF CONTENTS

1. INTRODUCTION

US Ecology, Inc. has requested that **AquAeTer** assist with the tank integrity assessment for the new Batch Stabilization Unit (BSU) constructed at the Hazardous Waste Management Facility (HWMF) near Beatty, Nevada. This tank integrity assessment conforms to the requirements of 40 CFR Part 264, Subpart J, Tank Systems.

2. FACILITY INFORMATION

The BSU will be used to stabilize and/or solidify hazardous wastes at the HWMF and treat hazardous debris prior to landfilling. Waste stabilization will be conducted in the BSUs, where waste and stabilization reagents (e.g., cement, kiln dust, lime, etc.) will be thoroughly mixed until a relatively homogeneous mixture is achieved. Water will be added to promote mixing and control air emissions, as necessary.

3. BSU OPERATIONS

The design of the double bay BSU (BSU 2) allows two separate wastes to be treated sequentially. The addition of a second mixing head would allow simultaneous stabilization and mixing activities to be performed on different wastes in each BSU bay. The BSU is constructed with truck load-out aprons on the north side of each BSU bay. Reagent silos are located near the BSU. The mixing unit is located at the center point on the south side of the two bays, allowing it to reach into each mixing bay.

4. BSU CONSTRUCTION

4.1 Construction Standards

The BSU is used for the mixing of hazardous waste and debris with reagents and stabilizing material to prepare the mixed material for disposal in the landfill. The BSU is used under atmospheric pressure conditions to accommodate the mixing activities, including both the distributed load of the waste and reagents and the small impact loads anticipated from the mixing head. Experience gathered from the single pan BSU, already located on site, was incorporated into the design of the new units.

A secondary containment structure is an integral part of the design to collect and drain liquids that pass through the primary walls of the two separate mixing bays. The secondary containment structures are accessed by two separate sumps. Additionally, the steel pan underlying the surrounding truck load-out apron area includes two sumps installed to capture precipitation and surface water that may penetrate the sacrificial soil layer.

4.2 Construction

Each of the two bays ("pans") of the new double-bay BSU is constructed in a similar fashion. Pan construction incorporates a primary and secondary containment system; each constructed of one-inch thick welded steel plate with standard structural steel members. The slope of the floor of the primary containment of the pans is toward the mixing unit; this facilitates the mixing process.

Separate sumps are located inside the secondary containment structure of each pan, near the mixing unit. The slope of each secondary containment structure is towards the respective sump. A steel pipe extends into the sump to allow the inspection and extraction of any liquid that accumulates within the secondary containment sump. The primary and secondary containment structures are sealed (welded) to prevent the migration of surface liquid from outside of the primary or secondary containment structures into the sump.

The load-out apron area is where the stabilized waste is transferred from haul trucks to the pan or from the pan to transport vehicles that transfers the stabilized waste to the landfill. The areas beneath the truck-load out apron area surrounding the pans are underlain with 1/4-inch thick steel plate sloped to drain to separate collection sumps, and covered with gravel and sacrificial soil.

4.3 Description of Secondary Containment Structure

In each double-walled tank system, the primary tank holds the waste materials and the secondary tank serves as secondary containment. Each secondary tank slopes to a collection sump. Each secondary containment structure is completely sealed to prevent the influx of surface water or precipitation. The secondary containment structure holds slightly more than 100 percent of the contents of the primary (interior) tank. The spacing between the two tanks is about four inches on all sides, along the dividing wall, and beneath the tanks. Since the two tanks are joined at the top (same elevation), the space formed by the structural steel angles ensures the containment is sufficient, and no additional calculations are required to demonstrate containment volume.

The integrity of the secondary containment structure was tested by filling each side of the BSU secondary containment structure with water and observing for the presence of leaks to the interior (i.e., into the pan) or to the exterior (i.e., outside the outer secondary containment wall). The tank integrity test was performed before backfill was placed around the tank. As a result of the initial test, minor leaks in the tanks were detected. These leaks were re-welded. The integrity of the secondary containment structure was re-tested by filling each side of the BSU secondary containment structure with water, and observing the fluid level for six hours for declines that could be caused by leaks that were not visible. A control test tank open to the atmosphere also was observed for evaporation losses. No leaks were detected in the integrity test of the secondary containment tanks. Notes documenting the results of the hydrostatic tests are included in facility records. The integrity of the welded steel aprons also was tested prior to the placement of the gravel and sacrificial soil.

4.4 Structural Strength

The BSU tanks are buried in level ground, and are not subject to sliding or overturning by seismic activity.

A mixing head will be used to perform the stabilization process. If used carelessly or improperly, the mixing head may be capable of damaging the floor or walls of the tanks. However, routine inspection and prompt repair of damage should prevent failure of the unit from such damage. Additionally, the BSU has been strengthened, as compared to the existing on-site BSU, by the use of thicker steel plate, which should also contribute to the durability of the unit.

4.5 Corrosion Protection

The steel components of the BSU are cathodically protected against corrosion by the use of one pound aluminum sacrificial anodes installed on the tank walls. One aluminum anode will be bolted to each side of the exterior of the secondary containment structure. The primary containment unit is welded to the secondary containment unit, and is therefore, also protected. The aluminum anodes will be monitored for corrosion and replaced as necessary.

4.6 Compatibility with Waste

The BSU could potentially be exposed to any of the waste streams handled at the facility, including inorganic aqueous liquids, organic liquids, water-based sludges, organic sludges, inorganic and organic solids. The primary wastes received for stabilization at the facility will be organic and inorganic solids and sludges.

Highly reactive materials, and materials with a high pH or low pH represent the greatest potential for incompatibility with the steel tanks. The likelihood of chemical incompatibility between reactive, acidic, or alkaline wastes and the steel tanks is considered small because of the treatment reagents' tendency to quickly combine with the most reactive constituents in the waste, limiting their ability to further react with the tank material. Routine cleaning operations between different waste types will remove waste residues remaining in the unit.

5. CERTIFICATION

AquAeTer, Inc. services relating to certification of Batch Stabilization Unit 2 at the Beatty, Nevada facility were provided in a manner that is consistent with current standards of practice and the degree of care and skill ordinarily exercised under similar conditions by reputable members of the same profession in similar localities. The conclusions presented in this certification are based upon observations made by **AquAeTer** representatives at selected locations and times during construction and testing of Batch Stabilization Unit 2.

The signature and seal provided below is a declaration by the Professional Engineer that, in his professional judgment, the subject project was designed, constructed, and tested in manner consistent with the referenced design document and applicable State and Federal regulations.

This certification was prepared under the Professional Engineer's direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. The information submitted is, to the best of the Professional Engineer's knowledge and belief, true, accurate, and complete.

AquAeTer, Inc.

By:

Stephen L. Wampler, P.E.

PROFESSIONAL ENGINEER-STATE OF NEVADA
STEPHEN L WAMPLER
CIVIL
No. 13641

15 JANUARY 2002

APPENDIX F

PCB TANKS ULTRASOUND LEAK TEST RESULTS

Western Technologies Inc.
The Quality People
Since 1955

3611 West Tompkins Avenue
Las Vegas, Nevada 89103 -5618
(702) 798-8050 • fax 798-7664

REPORT ON ULTRASONIC THICKNESS TESTING

CLIENT	US ECOLOGY PO BOX 578 BEATTY, NV 89003	Job No:	4168JK014
		Event/Invoice No:	01
		Authorized By:	MARK JOHN
		Observation Made By:	D. ALDERSON
		Date of Report:	1/15/09
Project	PCB LIQUID STORAGE TANKS (5 each)	Date of Testing	1/15/09
Location	US Ecology's Landfill and Hazmat disposal; US 95, 11 miles south of Beatty, NV		

Per client request, WTI performed ultrasonic thickness testing on PCB LIQUID STORAGE TANKS identified as WMU tanks T-4, T-5, T-6, T-7 and T-8 (formerly identified as A, B, C, D and on Vacuum tank E).

Test equipment: KB, USN-58L with FH2E dual transducer. Calibrated on 1018 steel step wedge. Echo technique was used to preclude the need to remove the new paint at the test spots.

There are no significant deviations in material thickness measurements compared to previous year's readings.

Tanks exterior paint is in good condition except the new paint does not extend to the tank center bottoms.

(T-top, B-bottom, N-north, S-south, E-east, W-west, C-center)

Thickness Test Results in inches

Tank A (T-4): horizontal E-W orientation					
East End: T-B-N-S-C	0.260	0.263	0.267	0.263	0.274
West End: T-B-N-S-C	0.250	0.258	0.261	0.265	0.260
Top: East to West	0.255	0.265	0.265	0.265	0.265
Bottom: East to West	0.255	0.260	0.272	0.265	0.258
North: East to West	0.262	0.262	0.265	0.269	0.257
South: East to West	0.260	0.262	0.259	0.267	0.258
Observations:					

Tank B (T-5): horizontal N-S orientation					
North End: T-B-E-W-C	0.237	0.229	0.237	0.239	0.237
South End: T-B-E-W-C	0.246	0.236	0.234	0.236	0.238
Top: North to South	0.253	0.244	0.265	0.246	0.246
Bottom: North to South	0.248	0.267	0.260	0.247	0.251
East: North to South	0.258	0.262	0.260	0.255	0.253
West: North to South	0.257	0.265	0.246	0.251	0.245
Observations:					

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CONTINUATION
ULTRASONIC THICKNESS TESTING

Tank C (T-6): horizontal N-S orientation					
North End: T-B-E-W-C	0.271	0.277	0.265	0.265	0.275
South End: T-B-E-W-C	0.232	0.244	0.229	0.234	0.246
Top: North to South	0.267	0.274	0.273	0.234	0.229
Bottom: North to South	0.265	0.272	0.255	0.241	0.234
East: North to South	0.272	0.277	0.269	0.246	0.243
West: North to South	0.265	0.274	0.244	0.241	0.236
Observations:					

Tank D (T-7): horizontal E-W orientation					
East End: T-B-N-S-C	0.276	0.277	0.276	0.279	0.284
West End: T-B-N-S-C	0.268	0.270	0.270	0.260	0.274
Top: East to West	0.265	0.273	0.265	0.245	0.281
Bottom: East to West	0.262	0.260	0.246	0.286	0.272
North: East to West	0.265	0.267	0.246	0.274	0.274
South: East to West	0.265	0.255	0.246	0.267	0.271
Observations:					

Tank E (T-8): horizontal E-W orientation					
East End: T-B-N-S-C	0.244	0.241	0.248	0.249	0.229
West End: T-B-N-S-C	0.255	0.241	0.251	0.251	0.234
Top: East to West	0.232	0.234	0.243	0.243	0.230
Bottom: East to West	0.234	0.232	0.246	0.242	0.237
North: East to West	0.234	0.229	0.250	0.230	0.231
South: East to West	0.232	0.243	0.244	0.229	0.232
Observations:					

If there are any questions, or if we can be of further assistance, please call us.

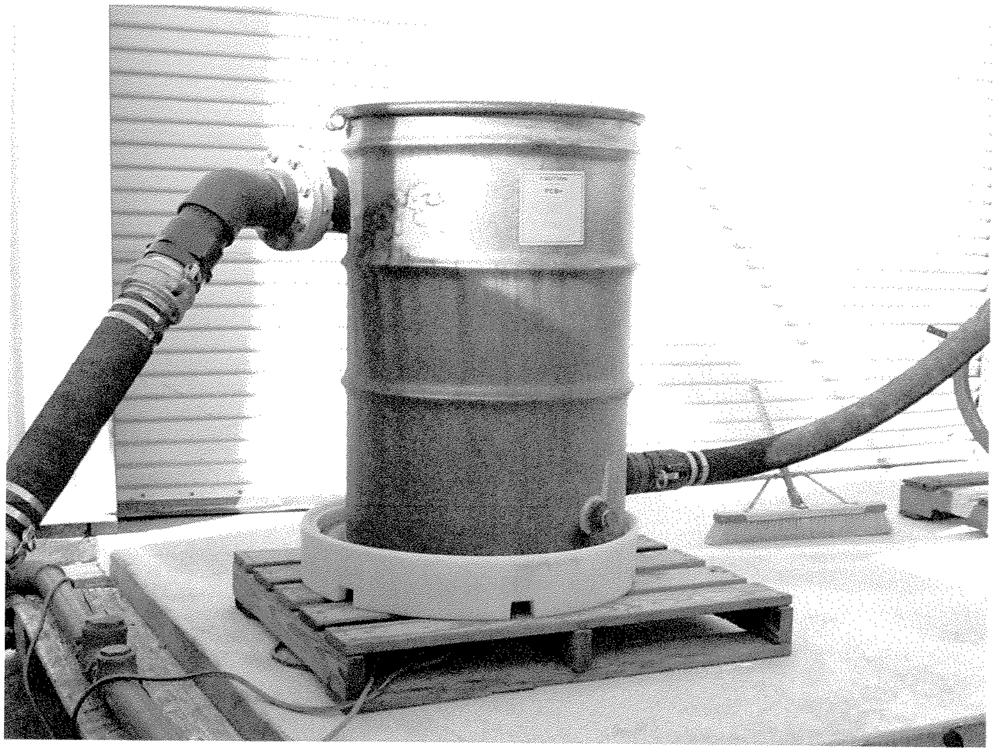
Respectfully submitted,
WESTERN TECHNOLOGIES INC.

David Alderson

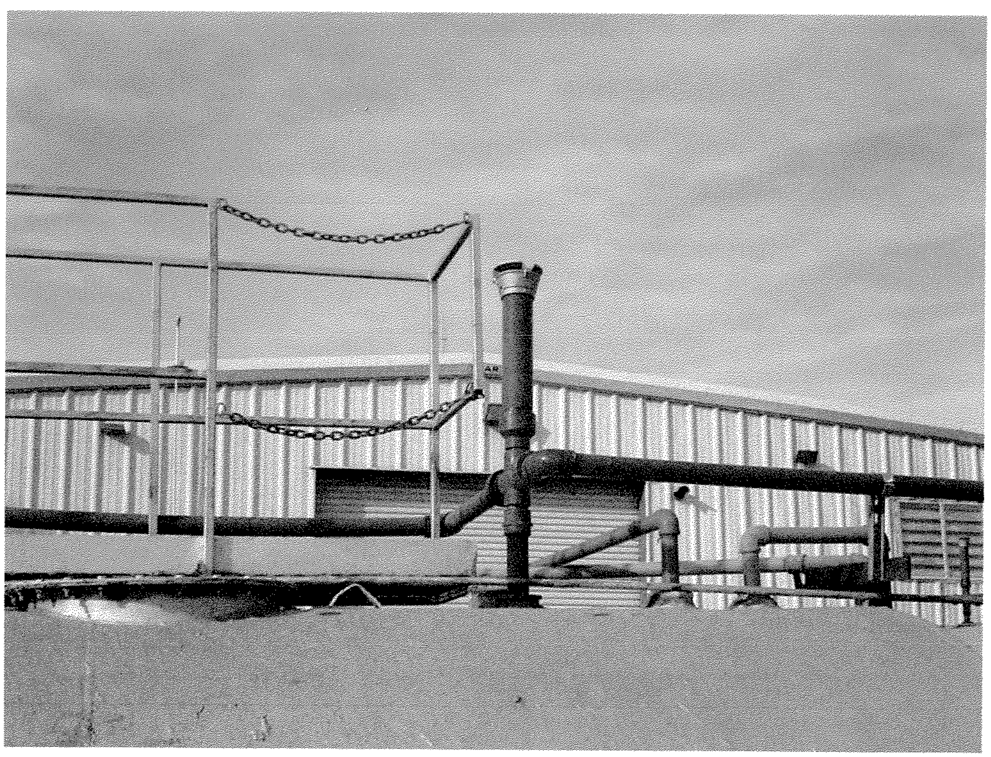
David B. Alderson, CWI, ASNT Level III
Director of Non-Destructive Testing

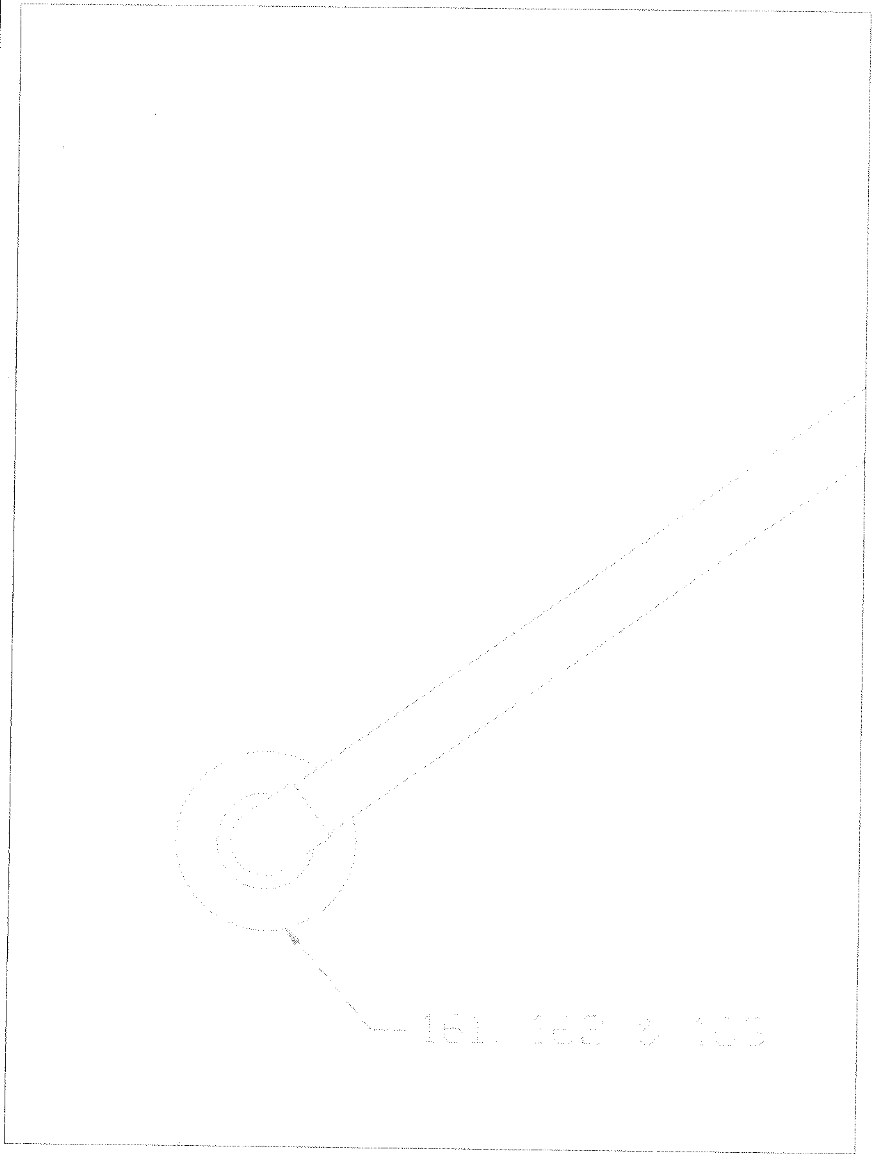
APPENDIX G

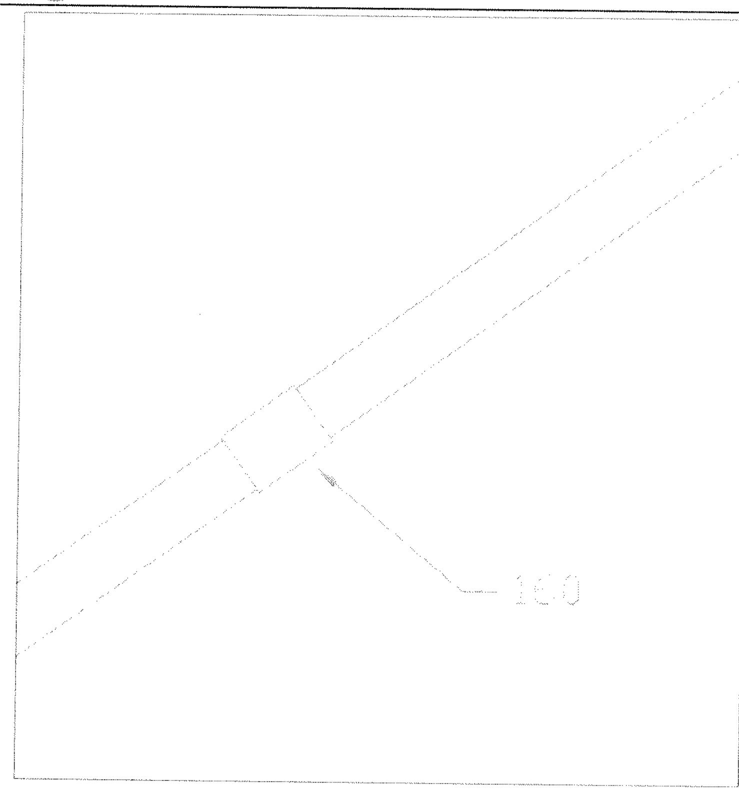
PCB PROCESSING SYSTEM P & I D

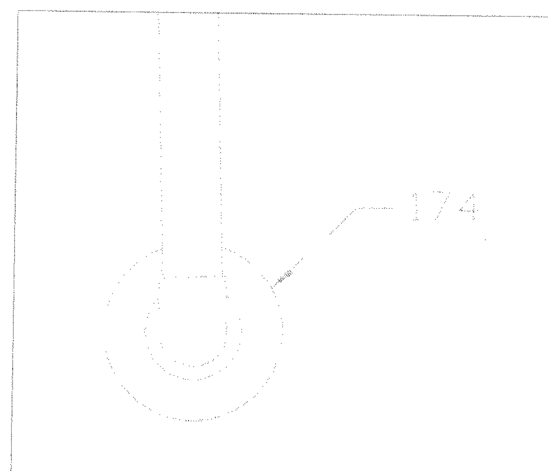



LIGHT IS FLASHING
DANGER







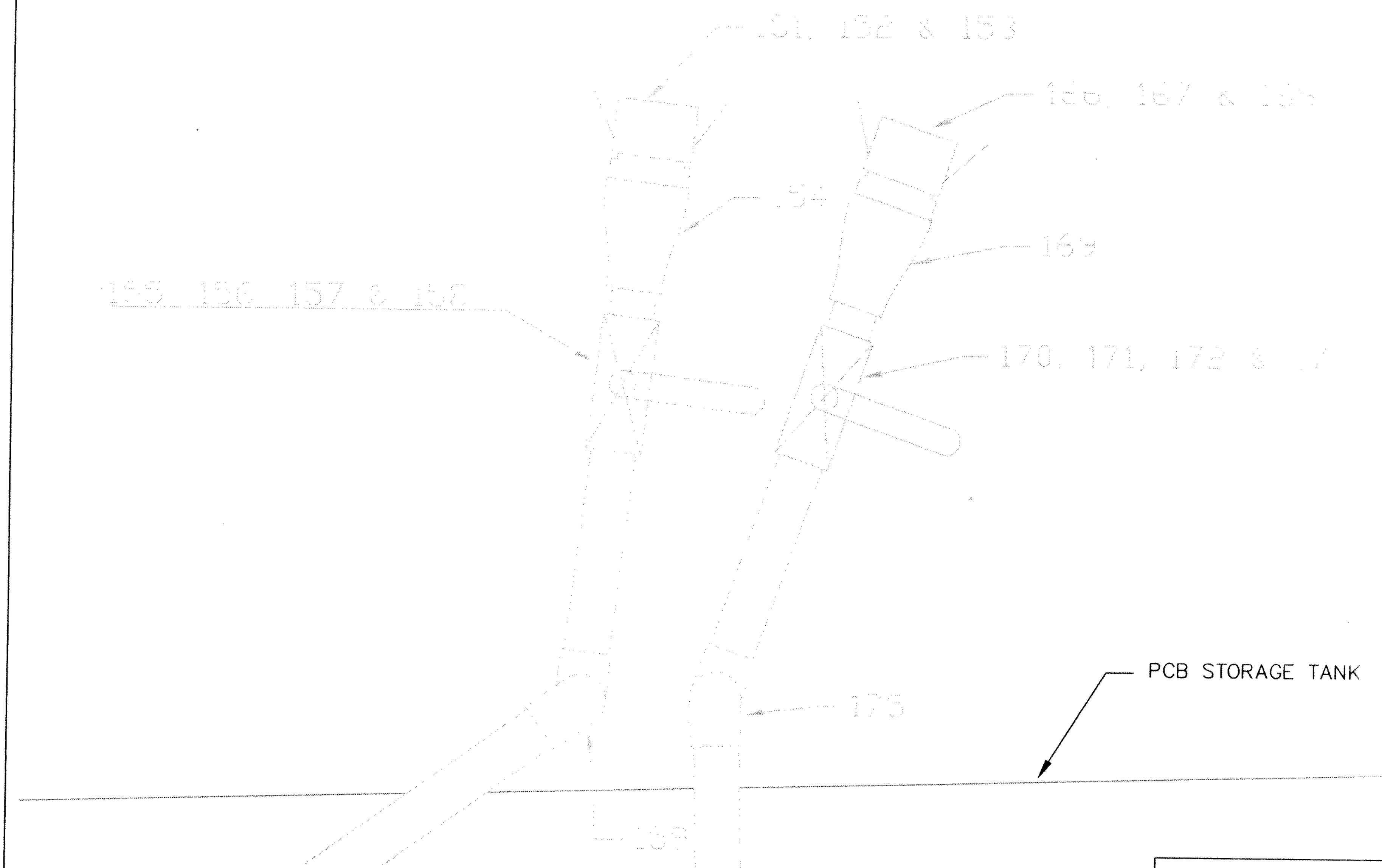


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

OUTGOING TANK SUCTION
DWG-001

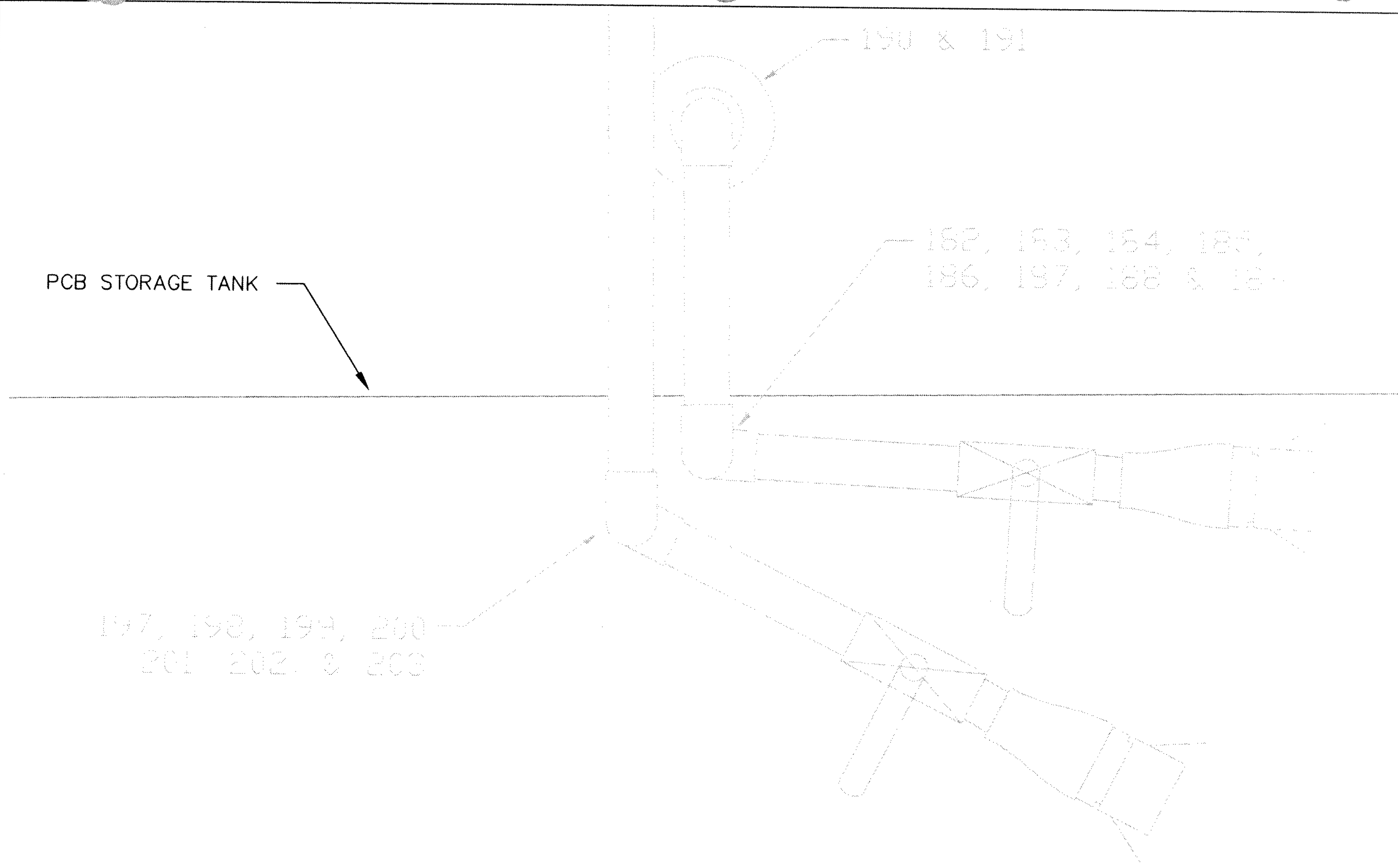


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

OUTGOING TANK SUCTION
DWG-002

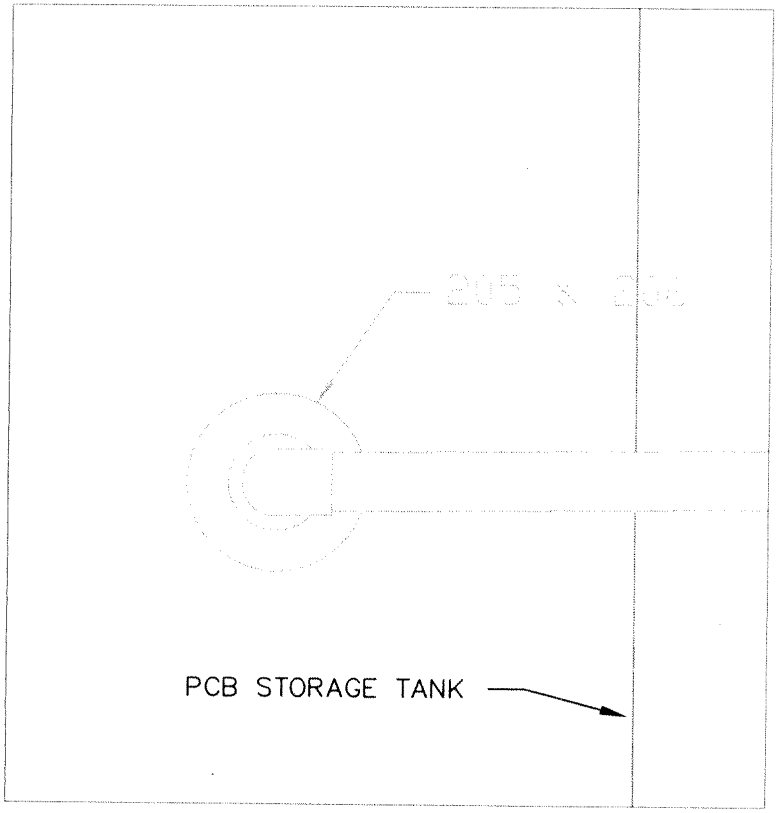


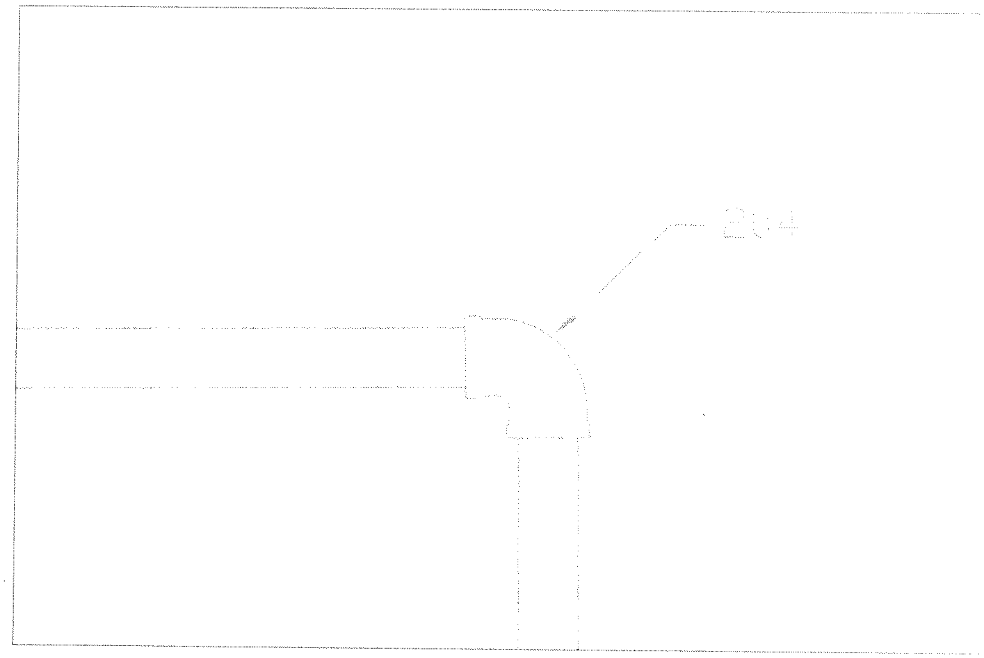
USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

OUTGOING TANK SUCTION
DWG-003



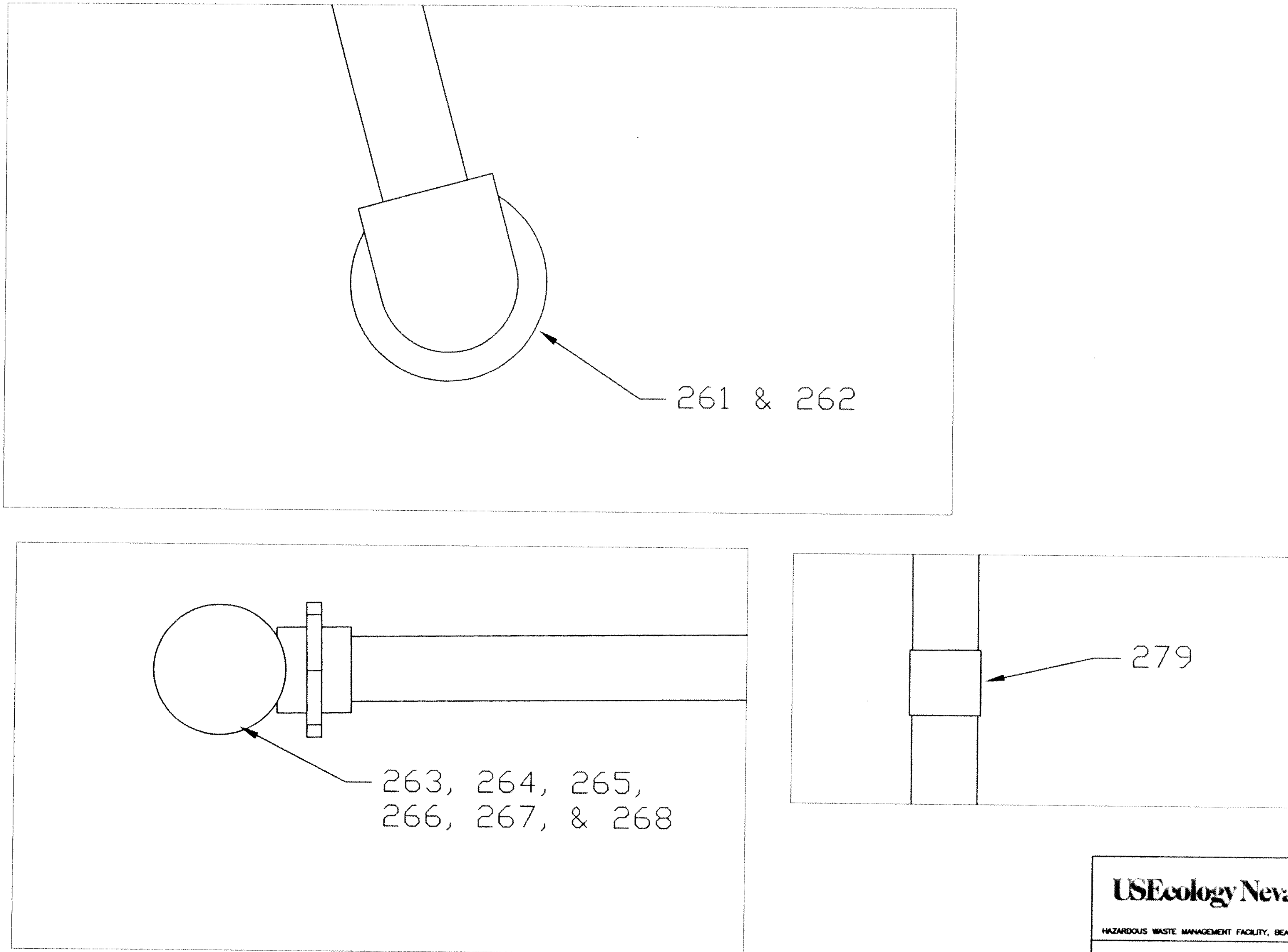


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

OUTGOING TANK SUCTION
DWG-004

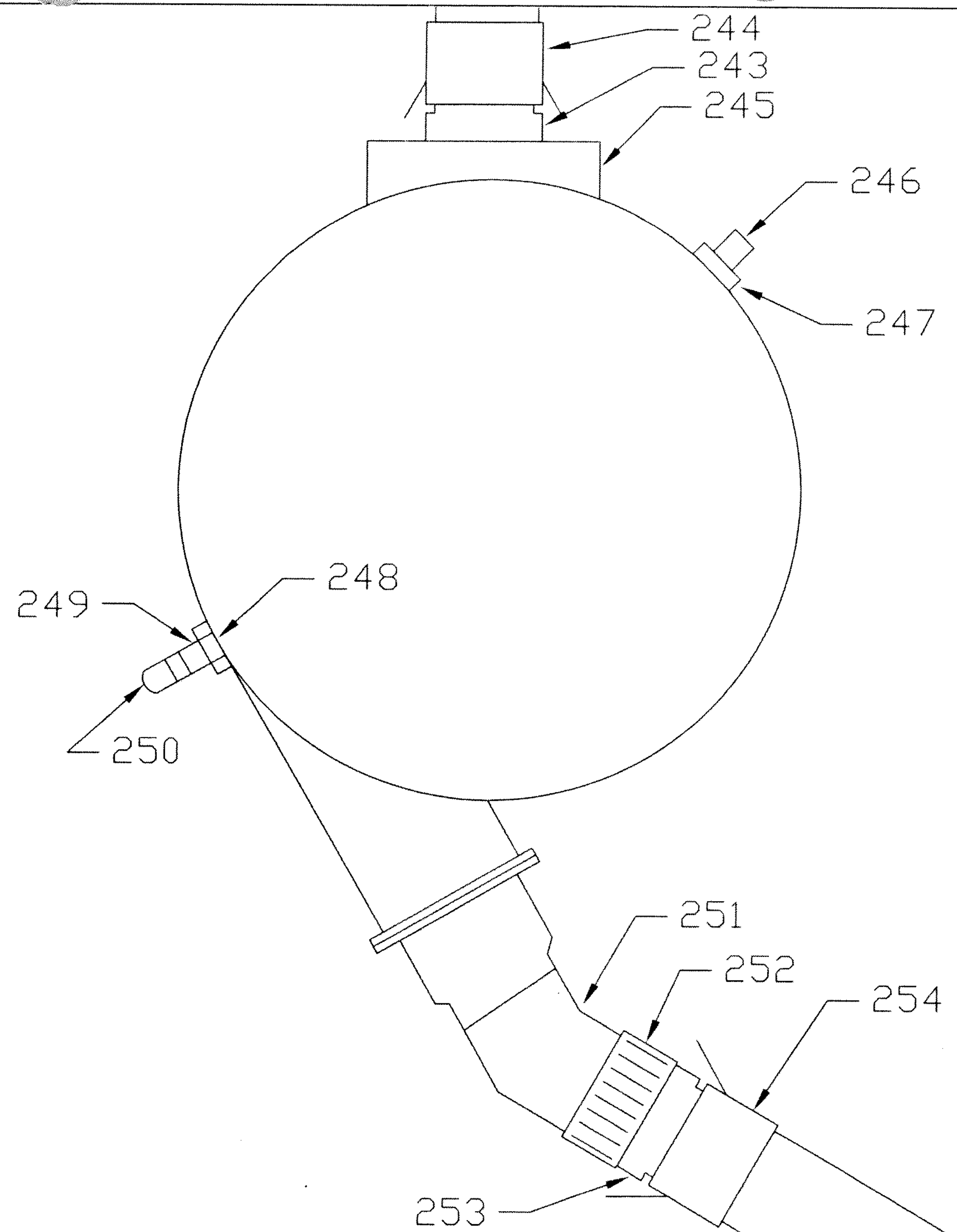


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

AIR RECOVERY SYSTEM
DWG-005

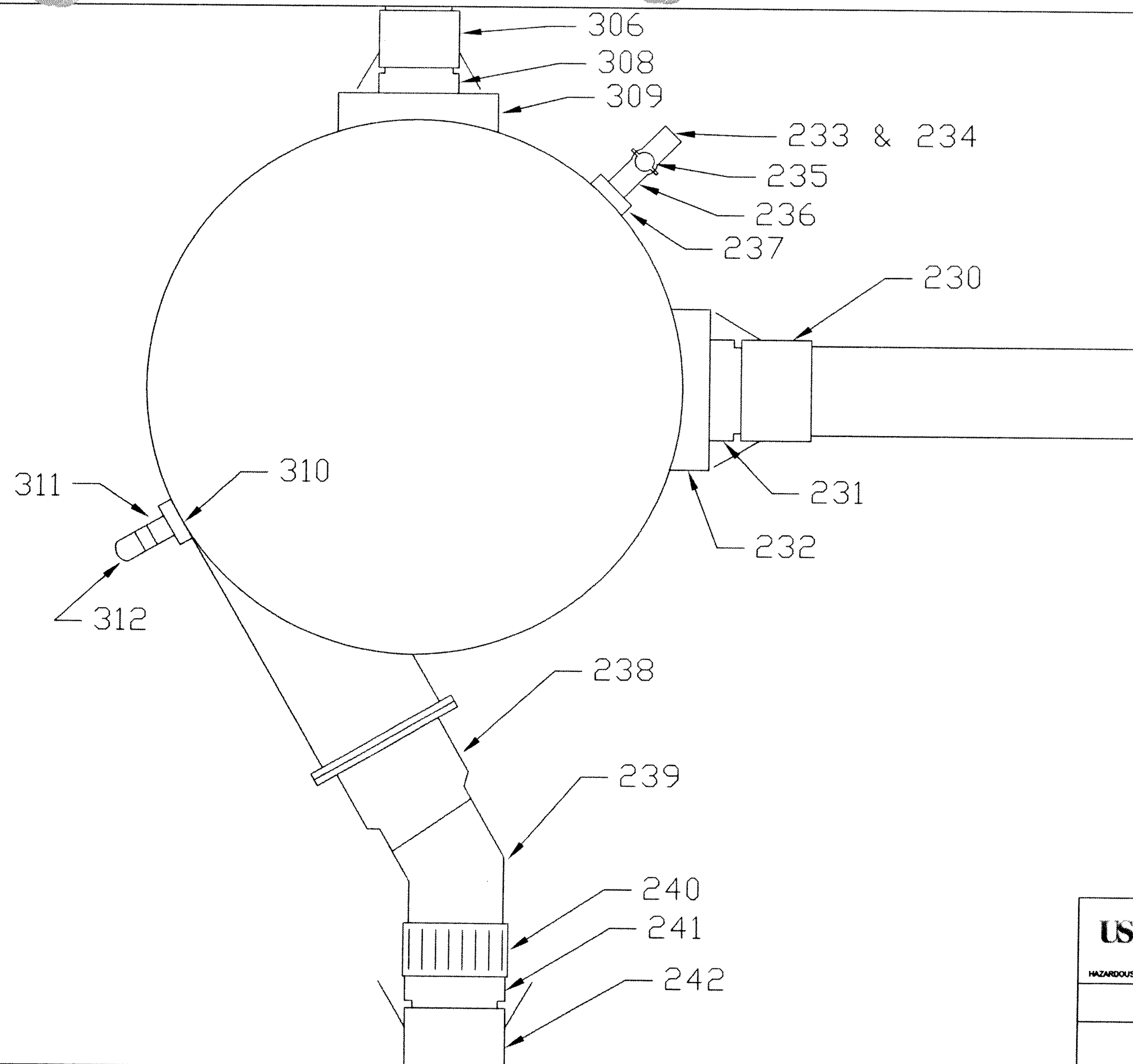


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

AIR RECOVERY SYSTEM
DWG-006

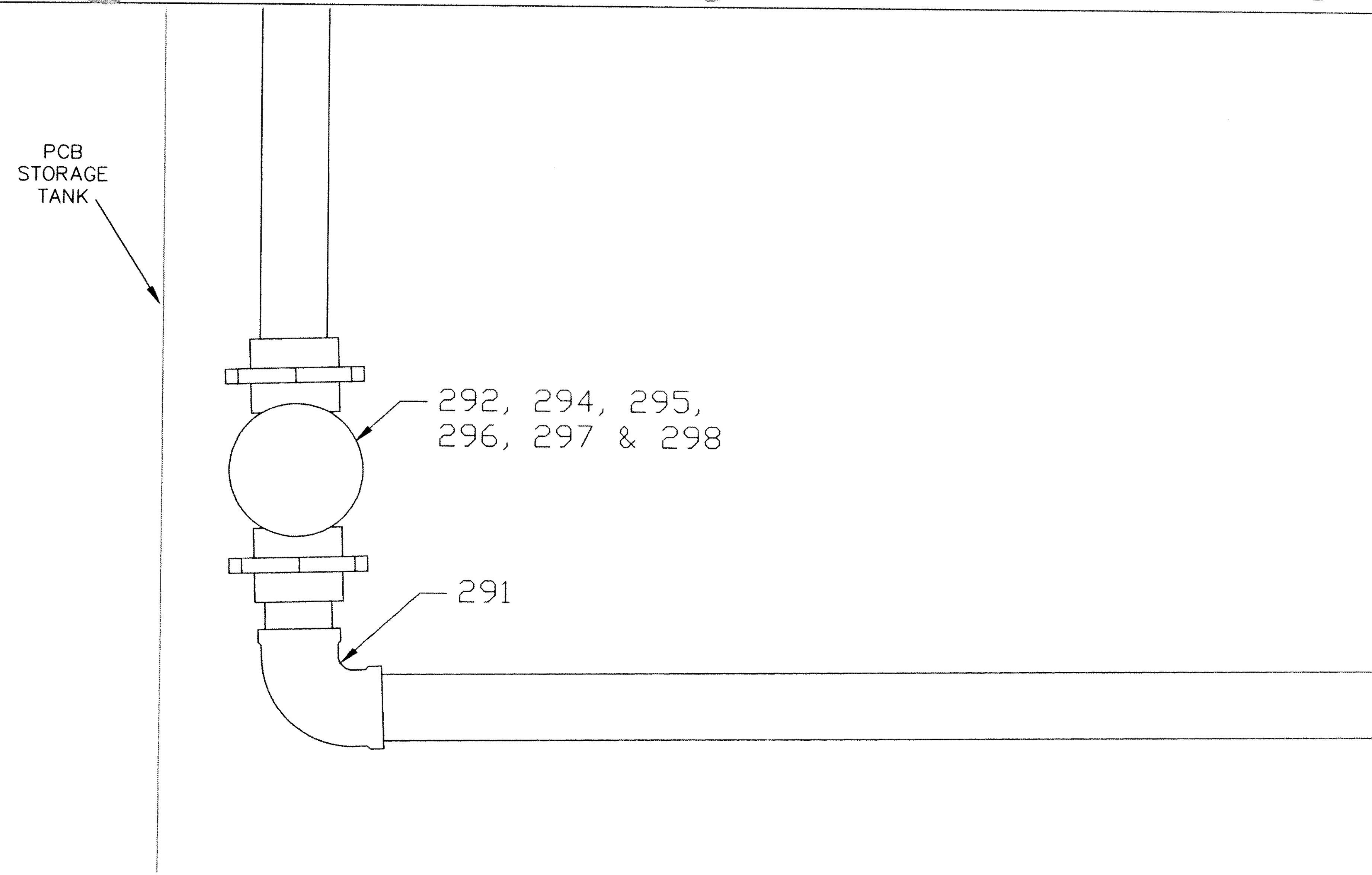


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

AIR RECOVERY SYSTEM
DWG-007



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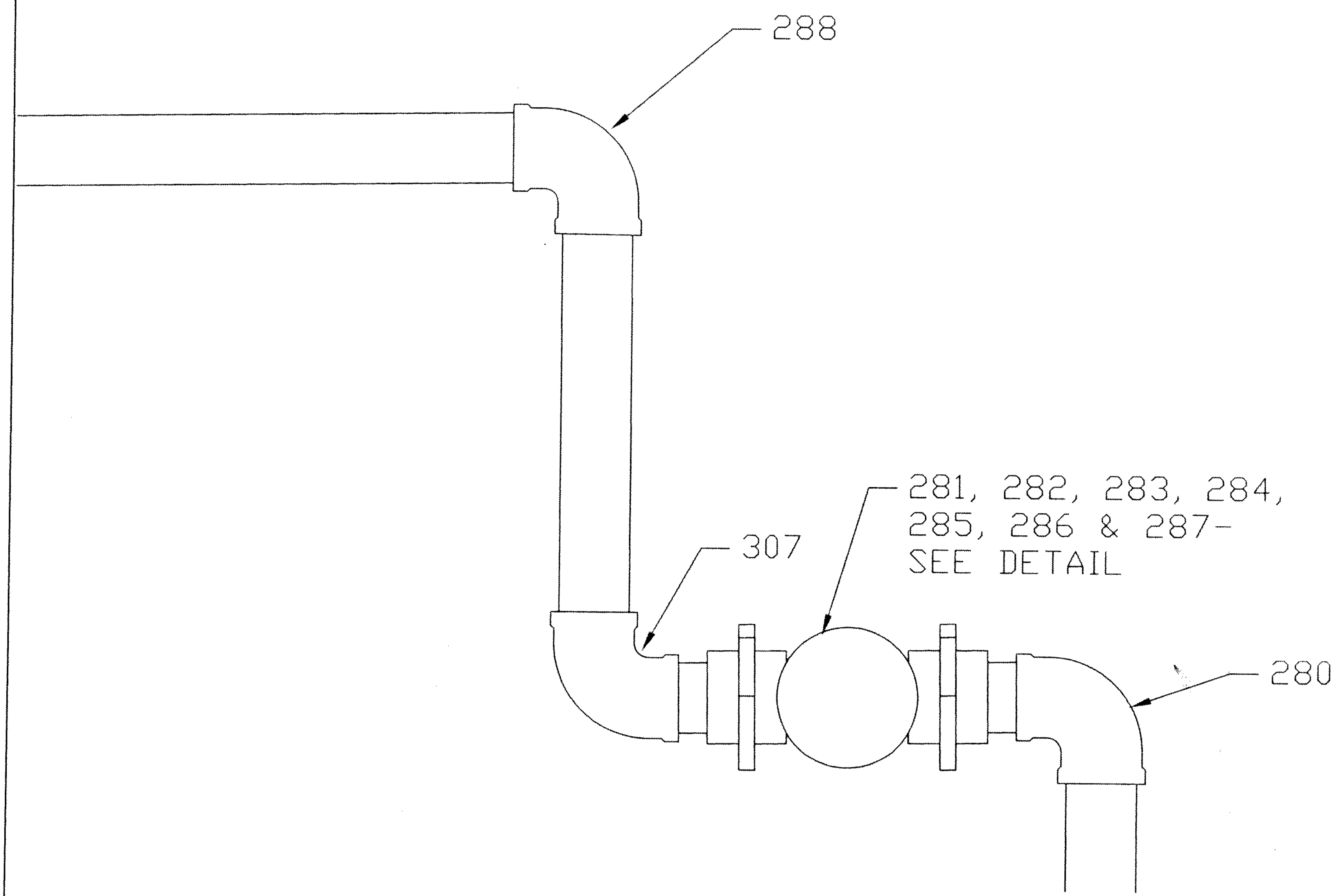
HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

AIR RECOVERY SYSTEM
DWG-008



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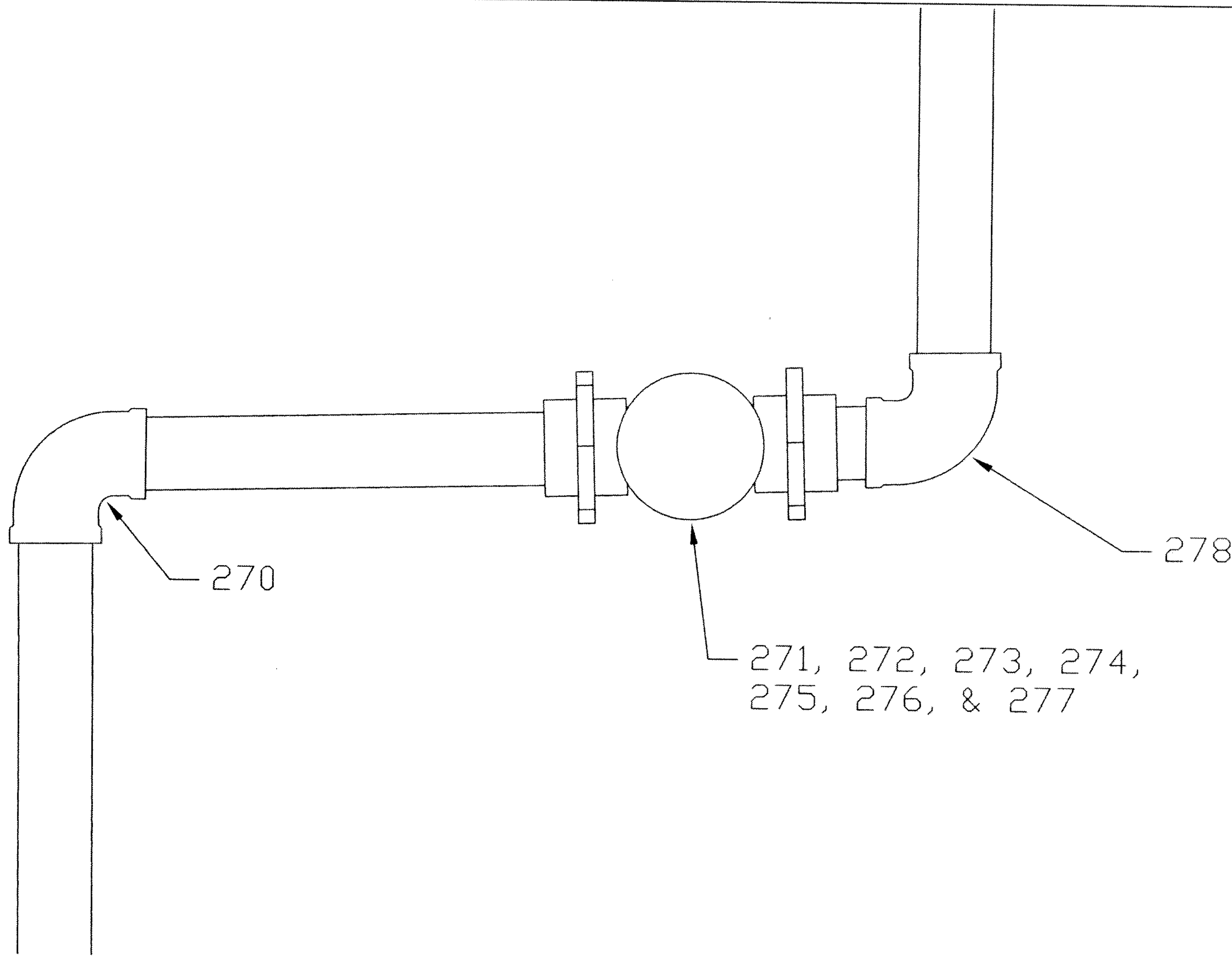
HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

AIR RECOVERY SYSTEM
DWG-009

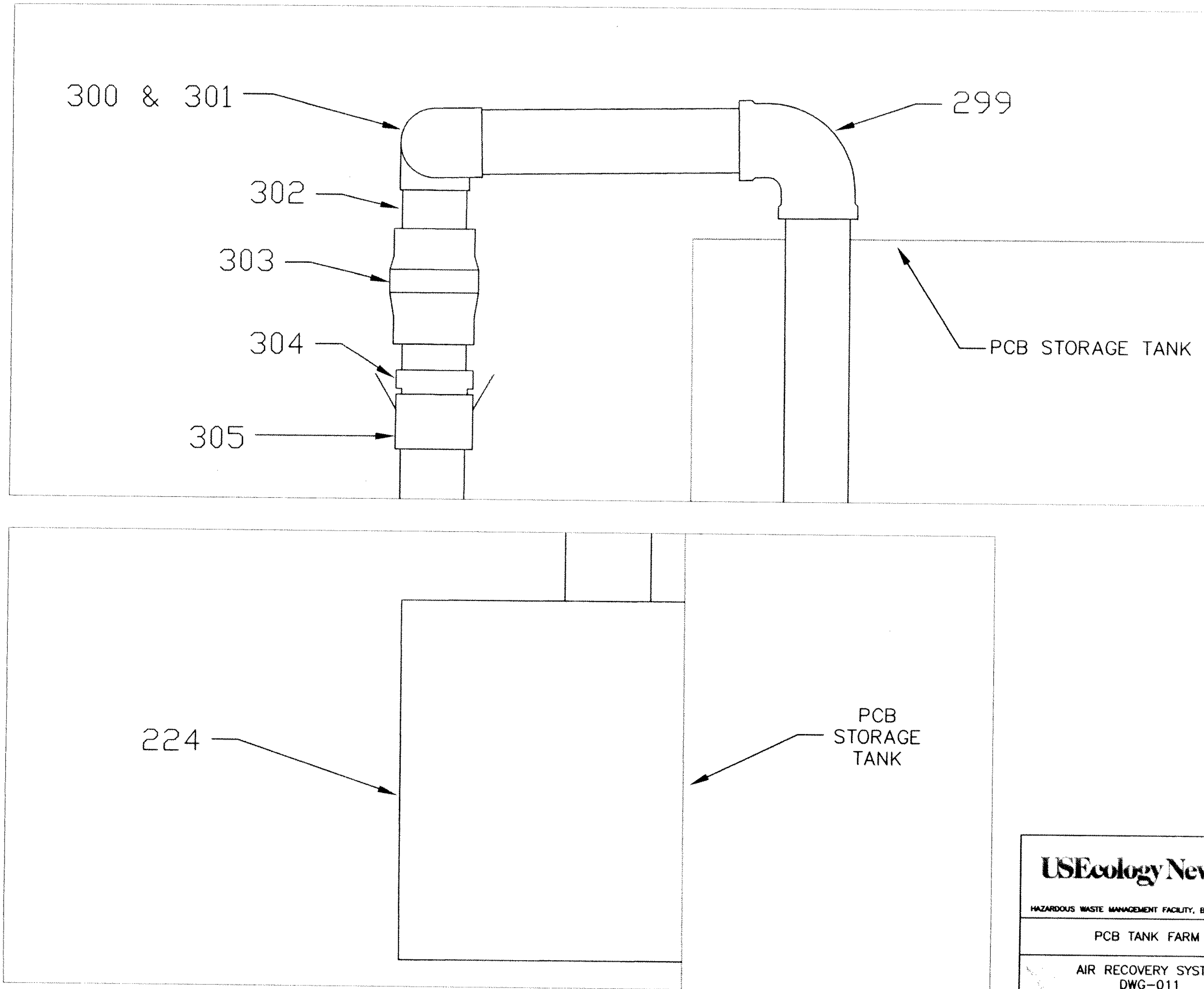


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

AIR RECOVERY SYSTEM
DWG-010

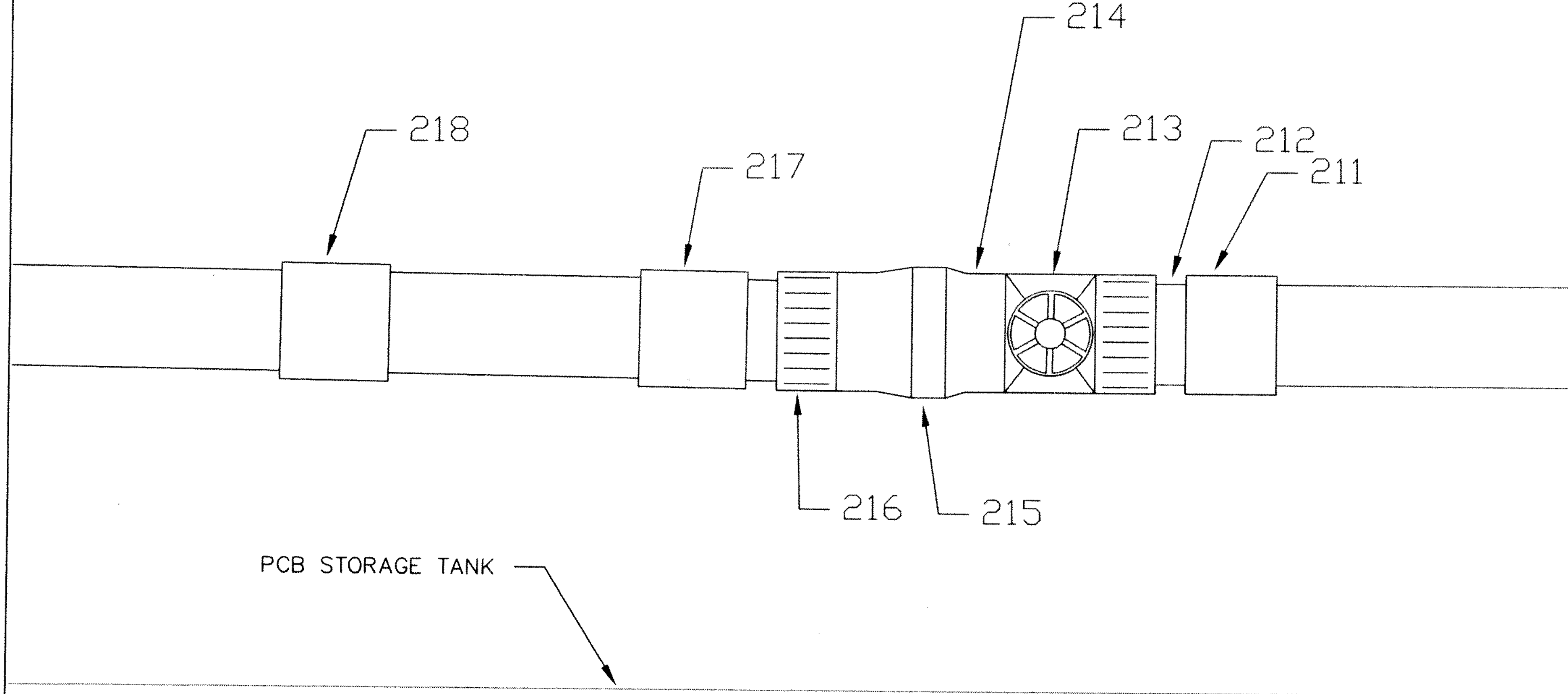


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

AIR RECOVERY SYSTEM
DWG-011

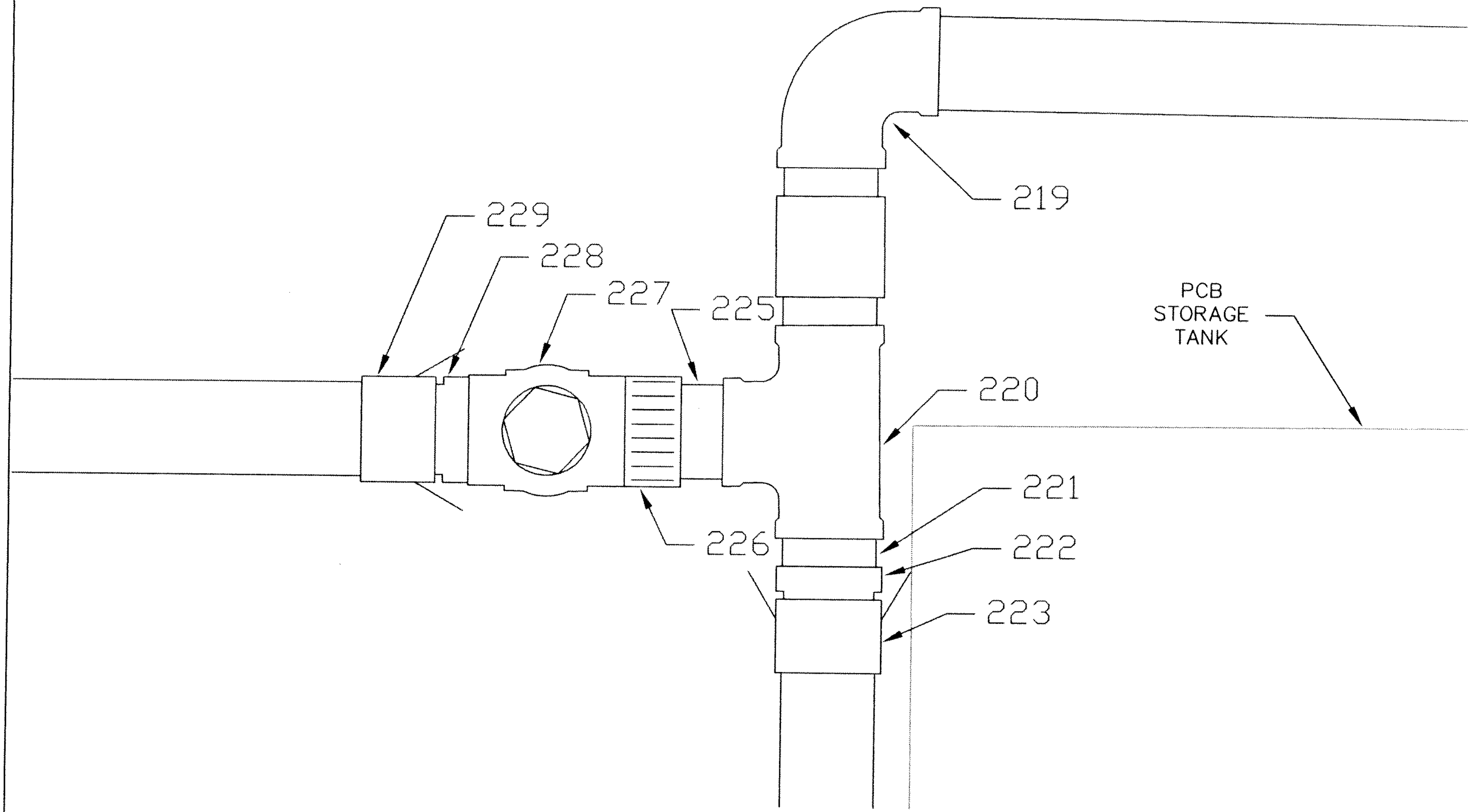


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

AIR RECOVERY SYSTEM
DWG-012

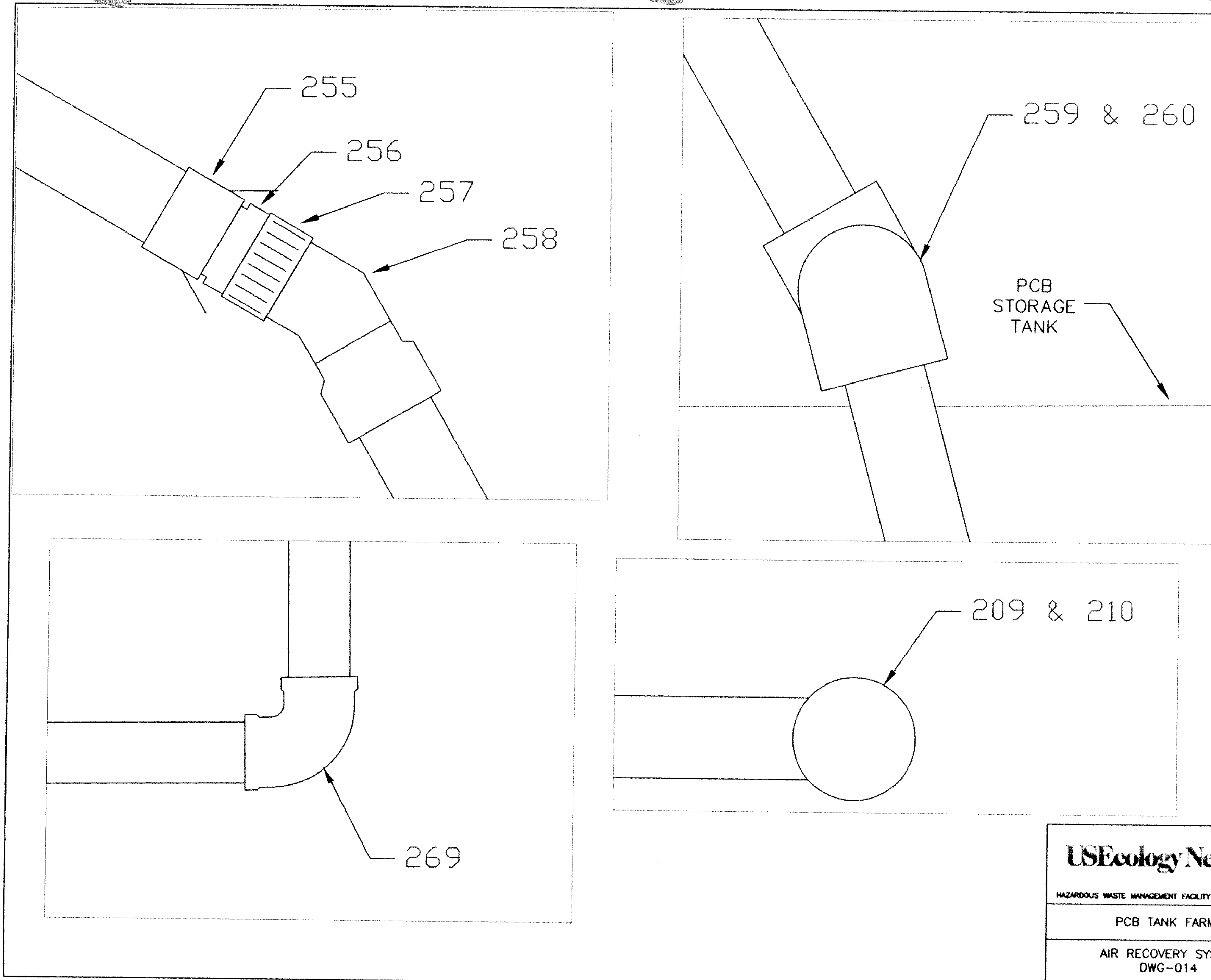


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

AIR RECOVERY SYSTEM
DWG-013

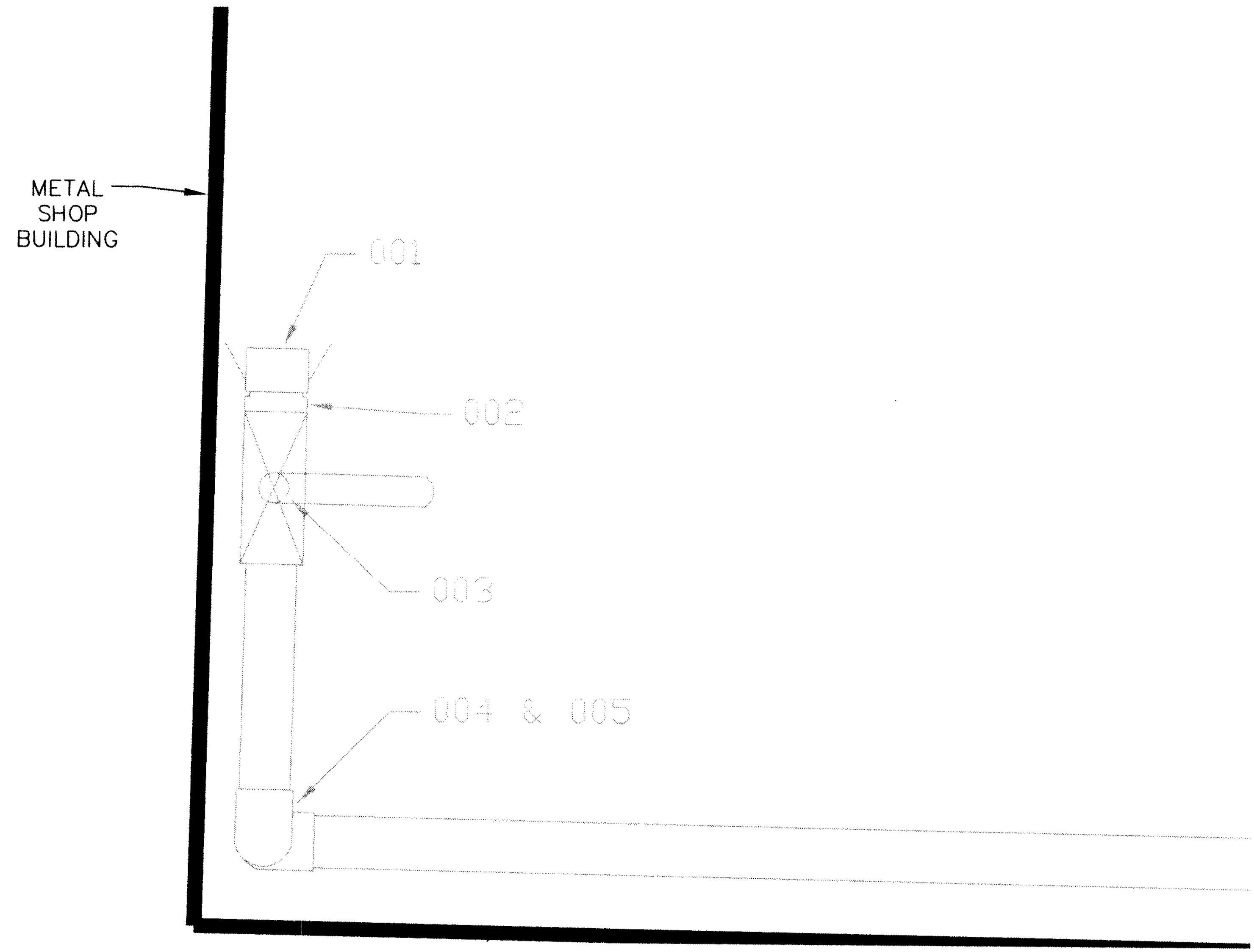


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

AIR RECOVERY SYSTEM
DWG-014

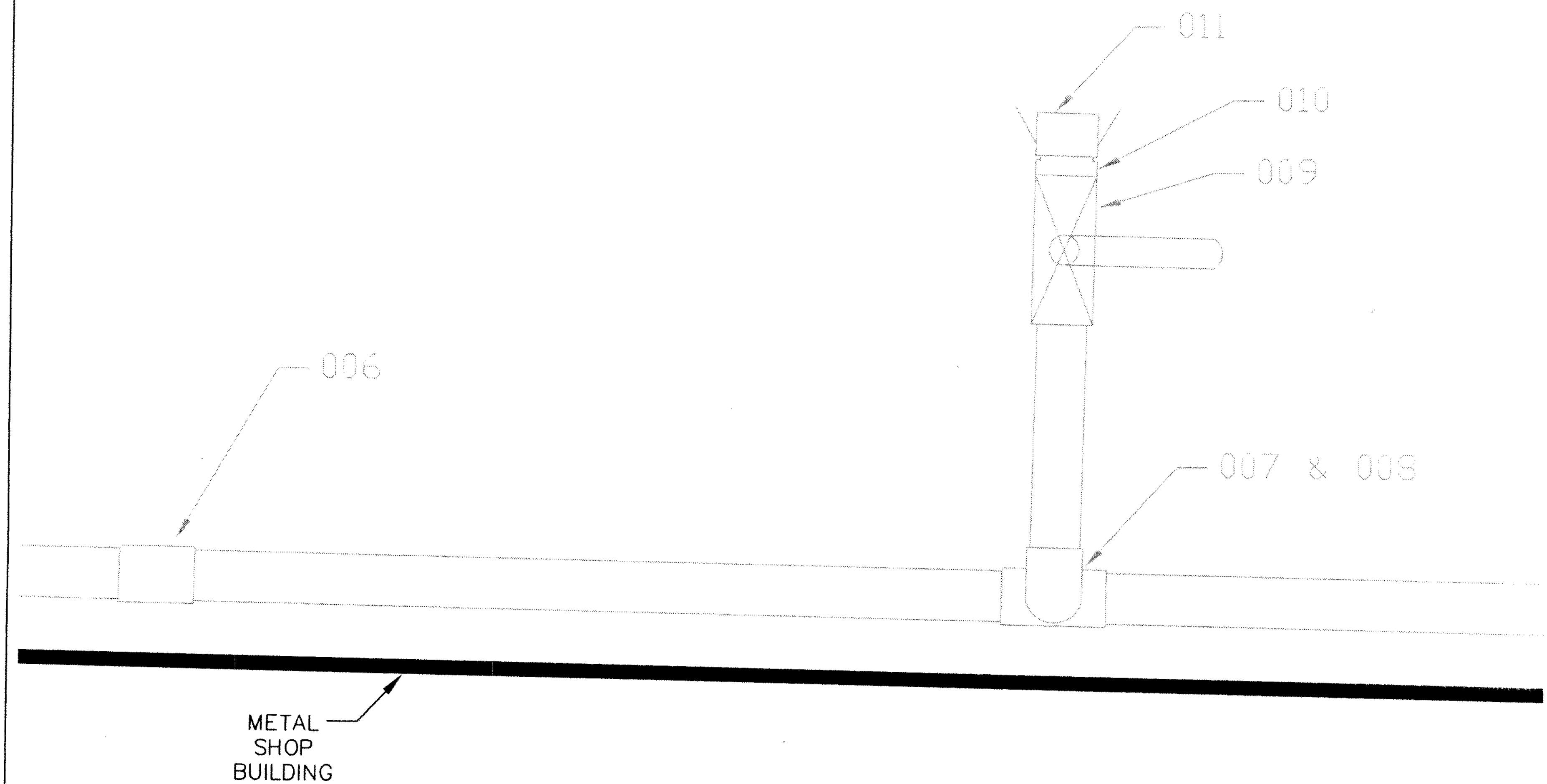


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

DIESEL SYSTEM
DWG-015

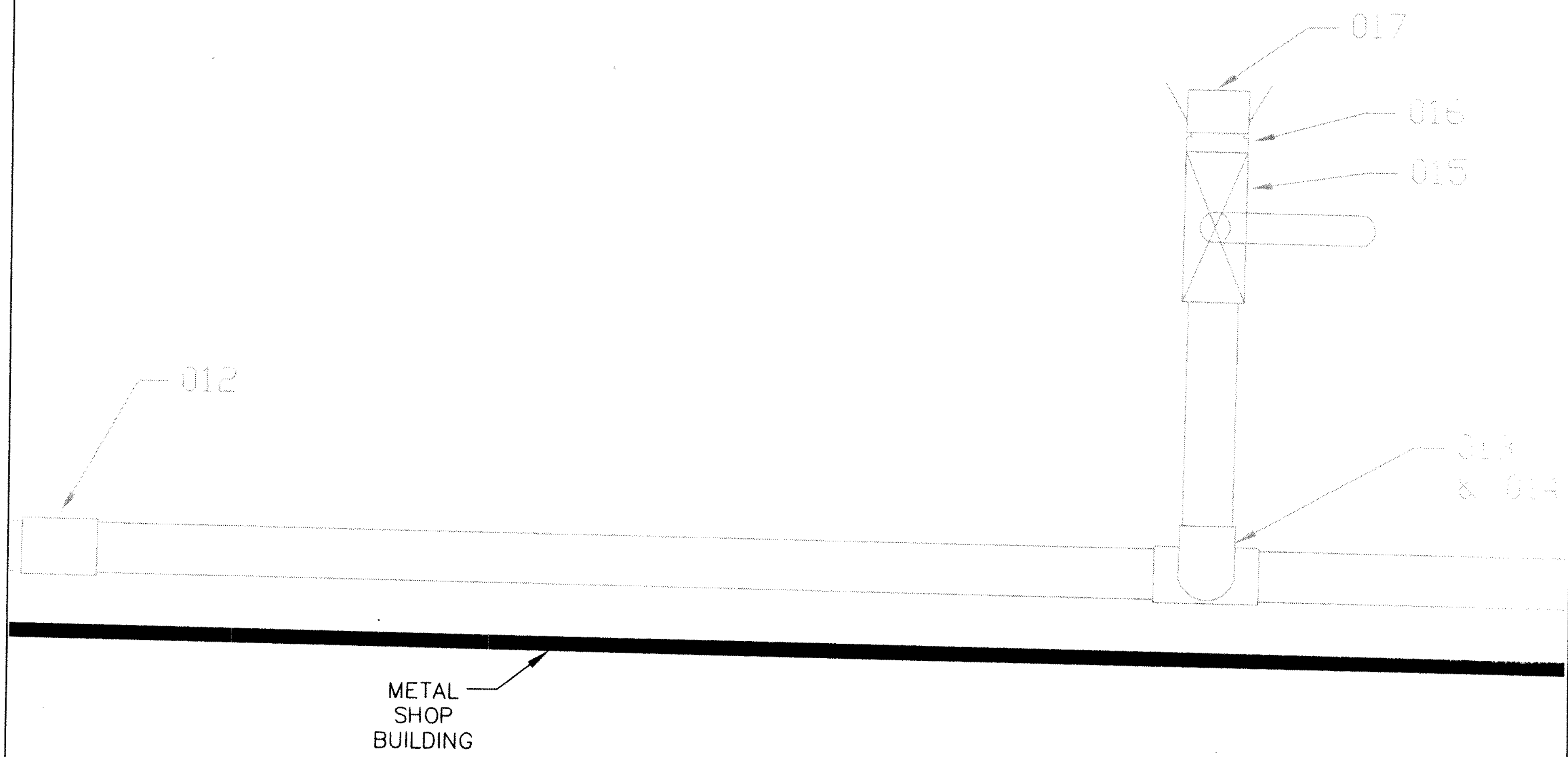


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

DIESEL SYSTEM
DWG-016



USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

DIESEL SYSTEM
DWG-017

USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

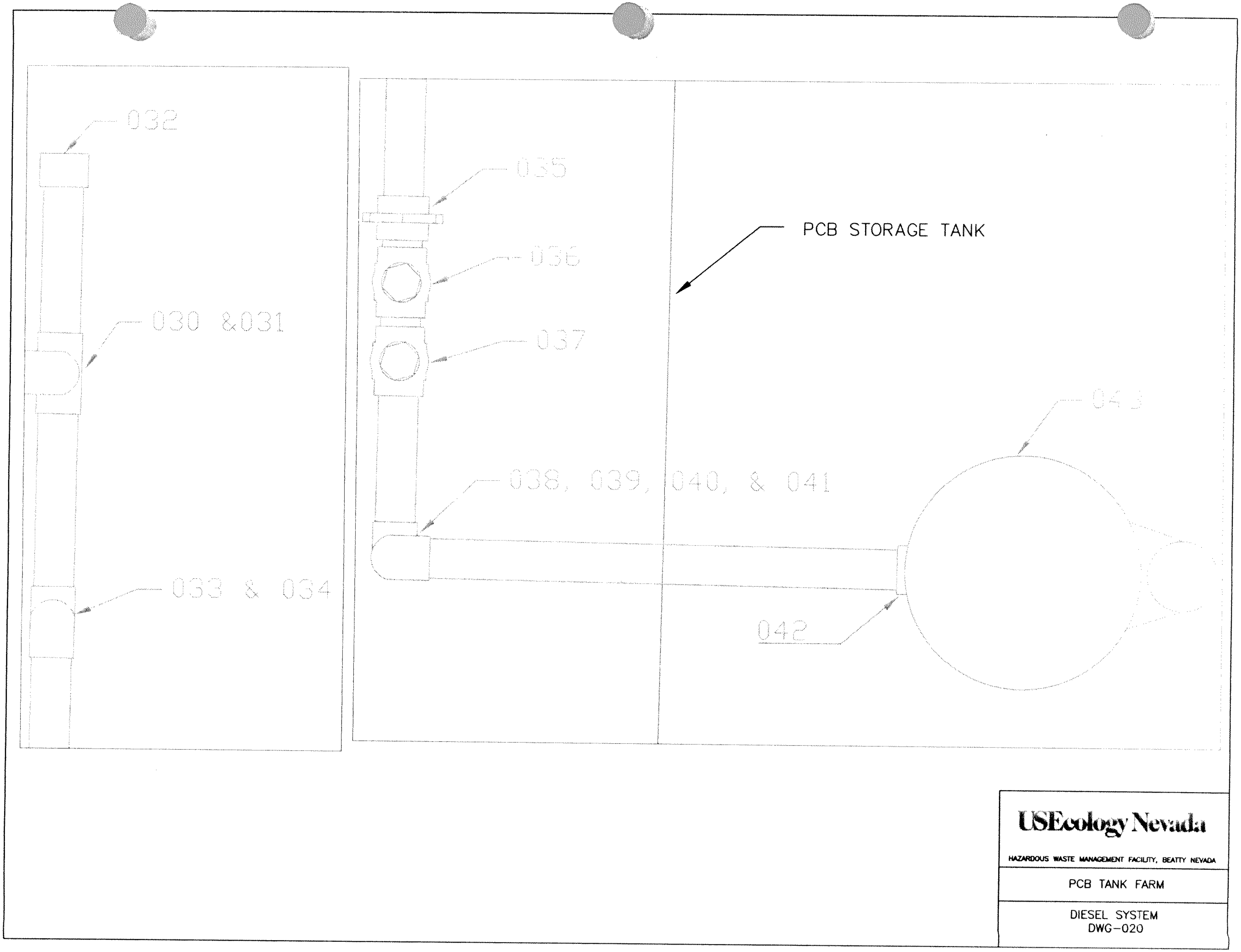
DIESEL SYSTEM
DWG-018

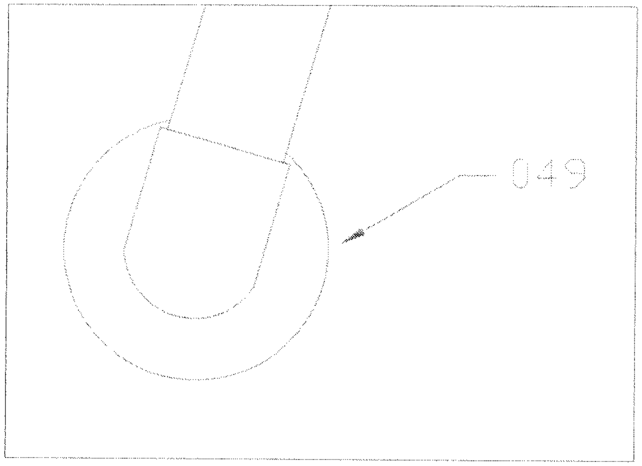
USEcology Nevada

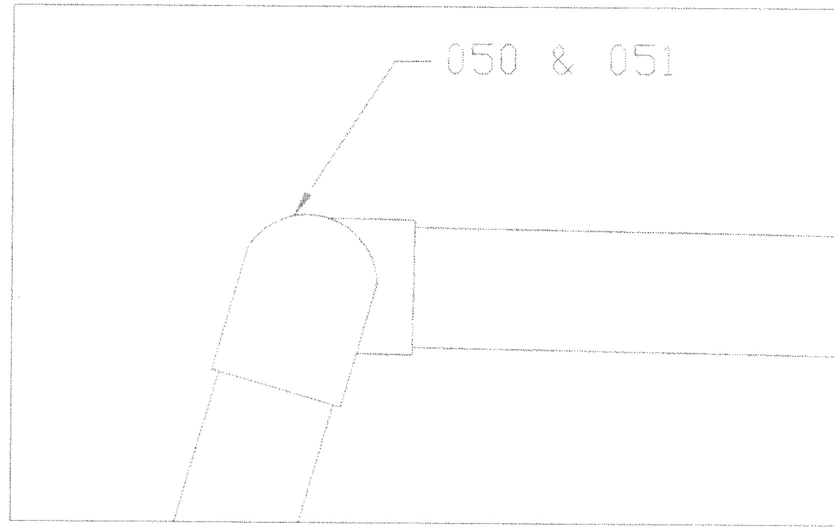
HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

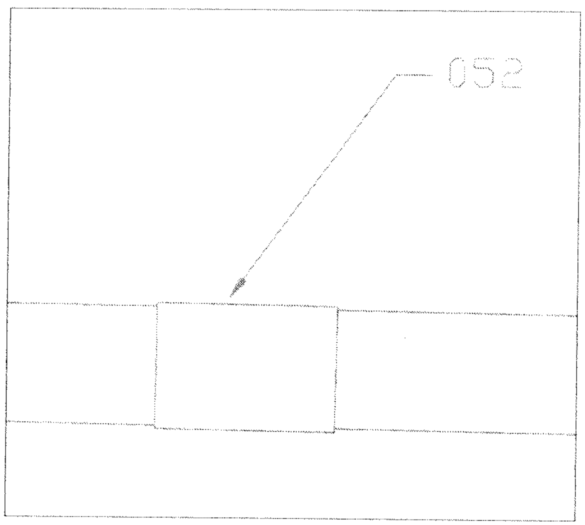
PCB TANK FARM

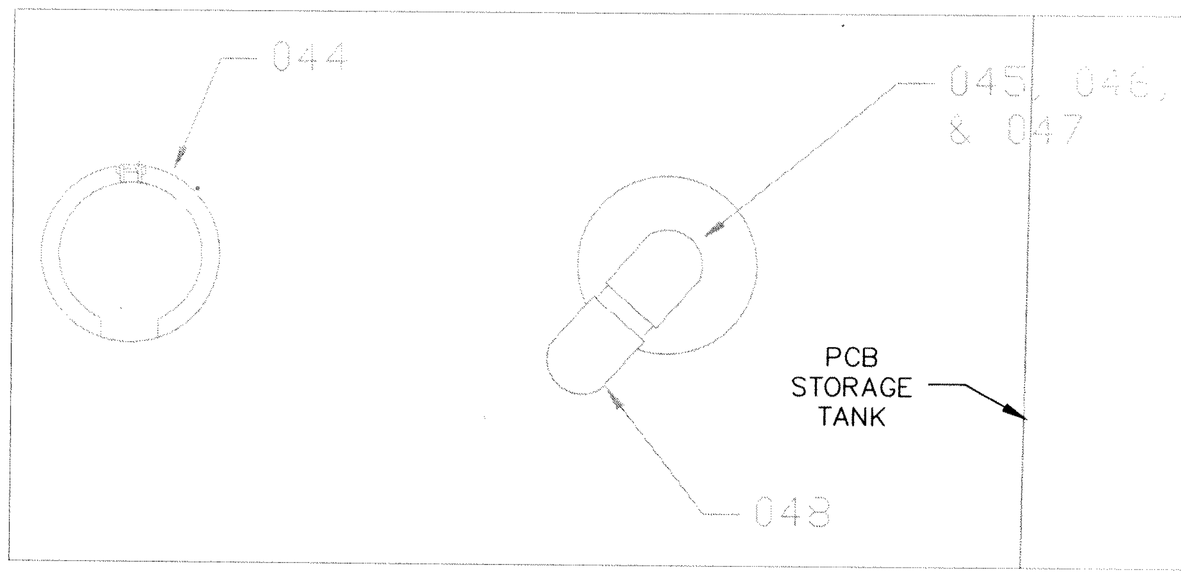
DIESEL SYSTEM
DWG-019


032
030 &031
033 & 034
035
036
037
PCB STORAGE TANK
043
038, 039, 040, & 041
042
USEcology Nevada
HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA
PCB TANK FARM
DIESEL SYSTEM
DWG-020







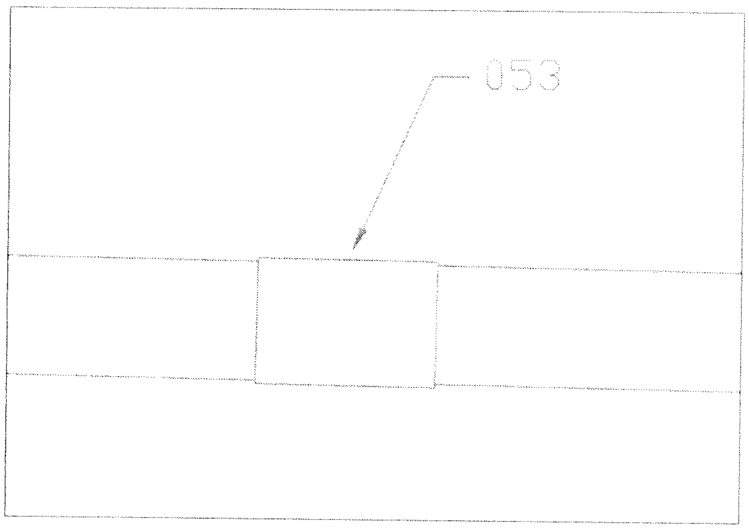


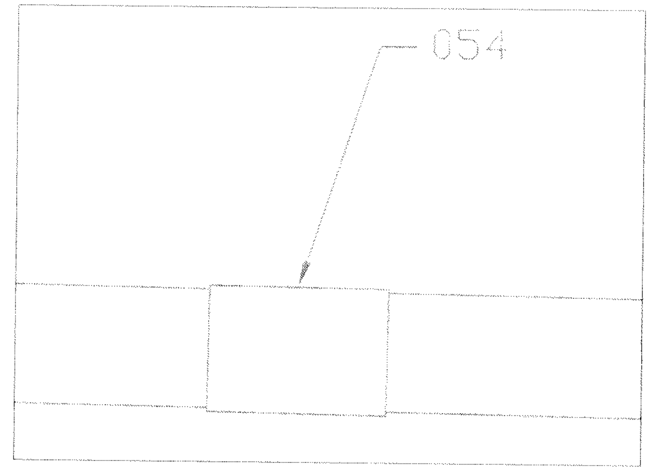
USEcology Nevada

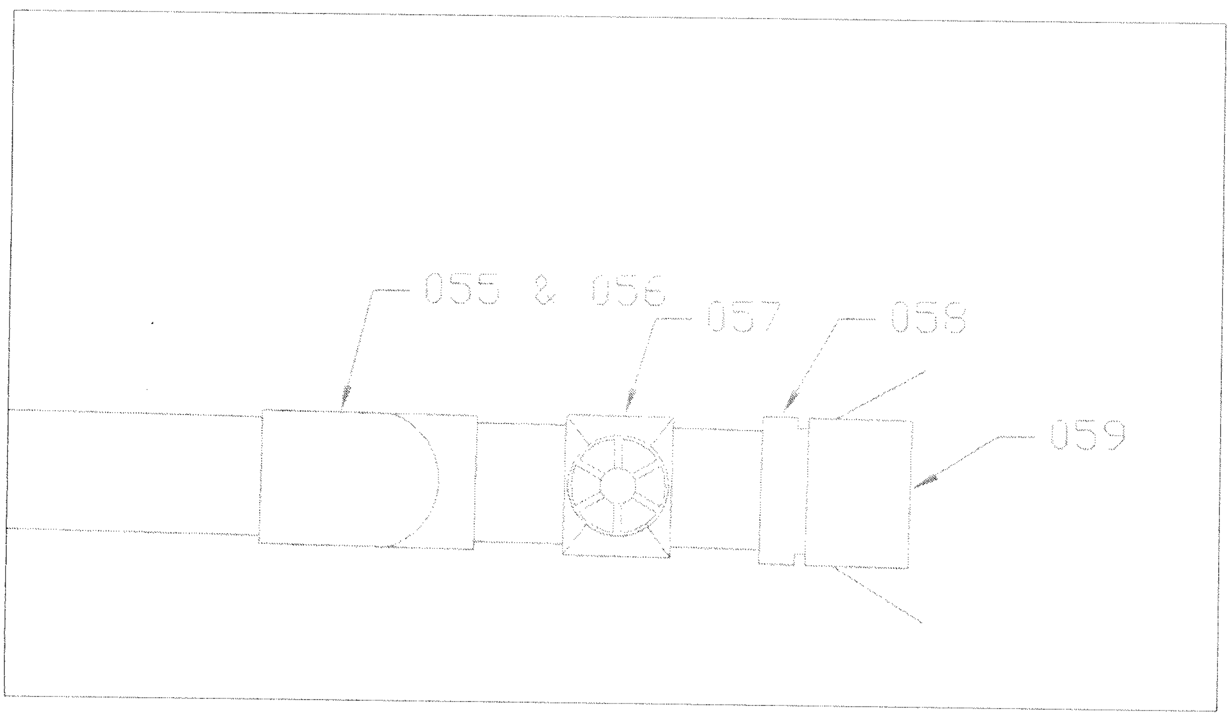
HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

DIESEL SYSTEM
DWG-021





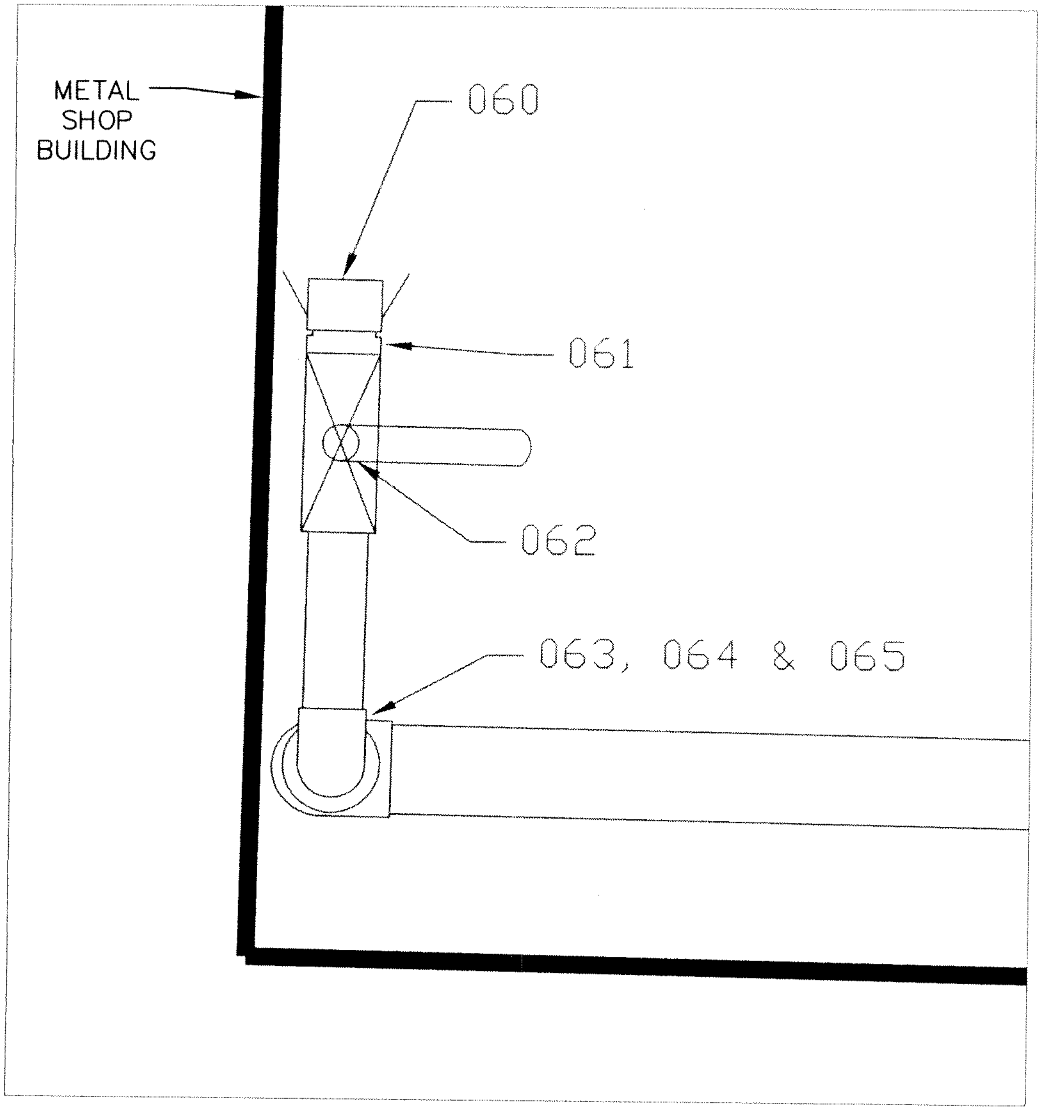


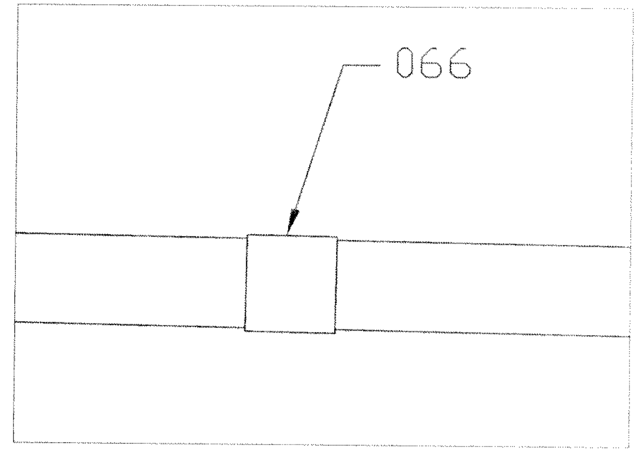
USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

DIESEL SYSTEM
DWG-022



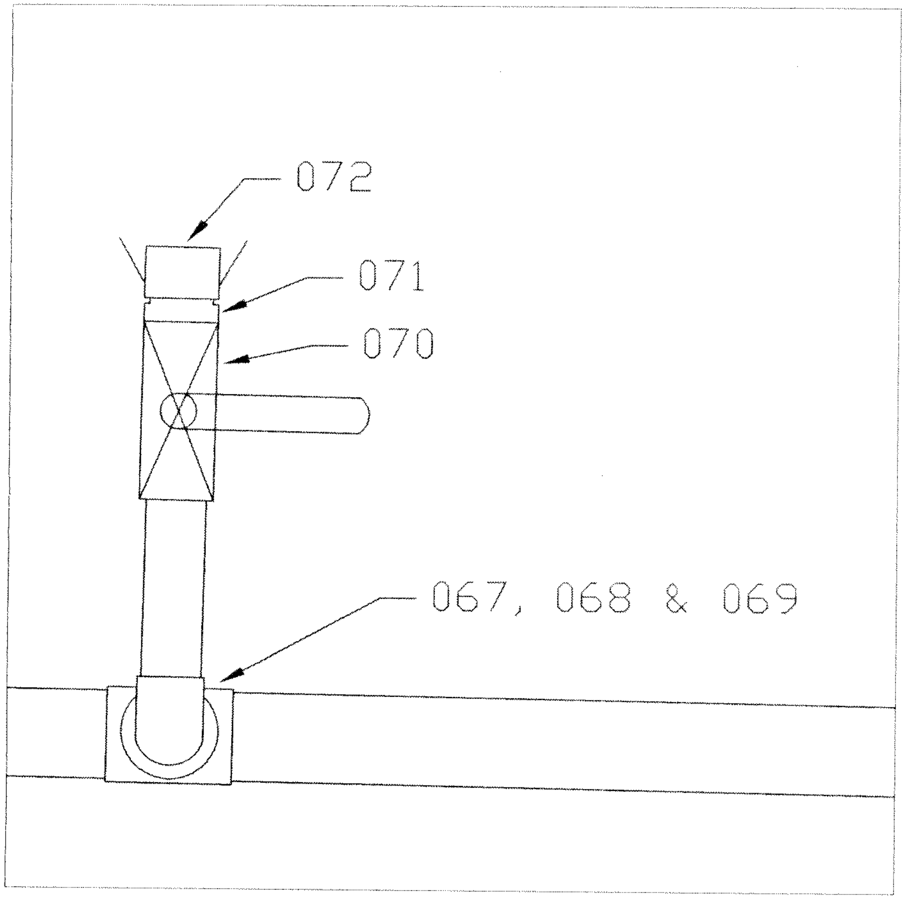


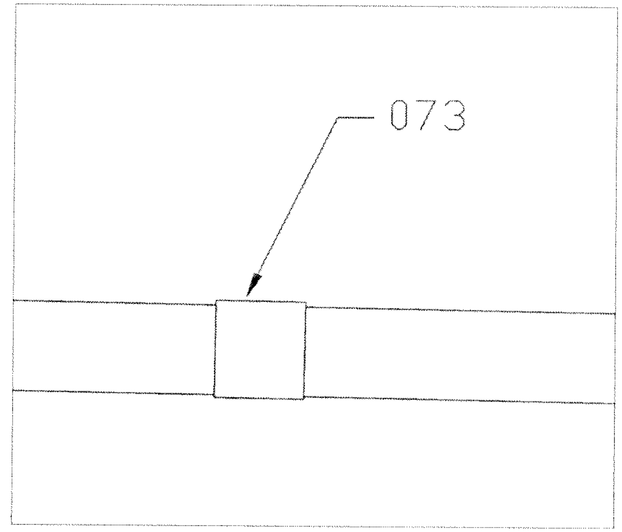
USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-023



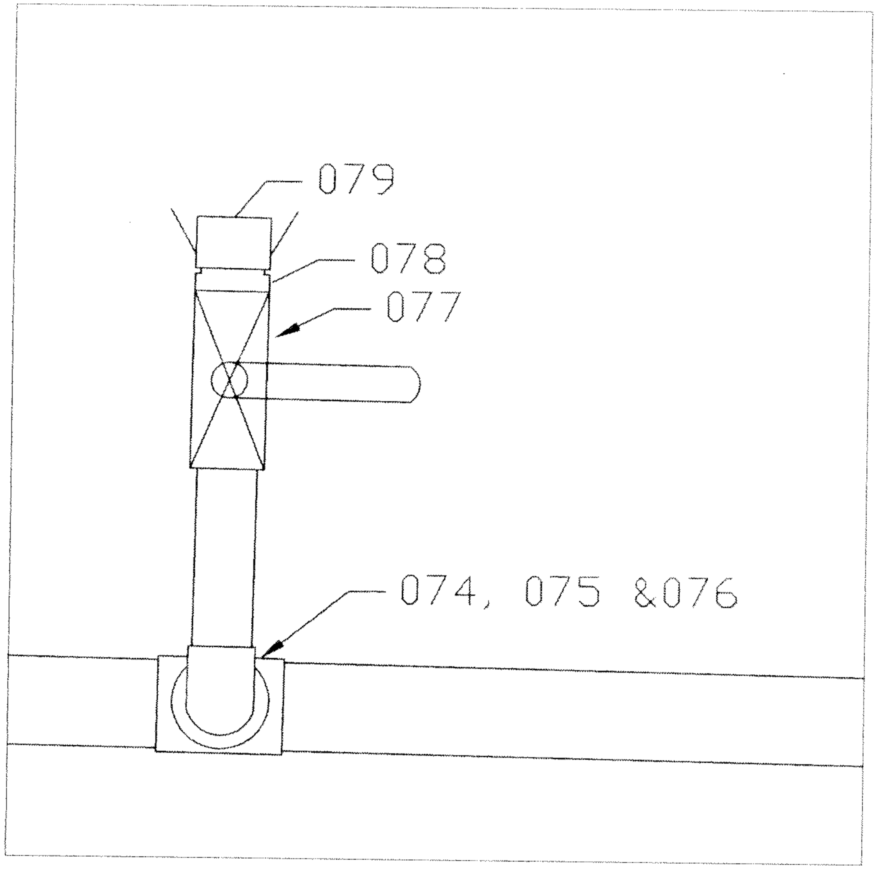


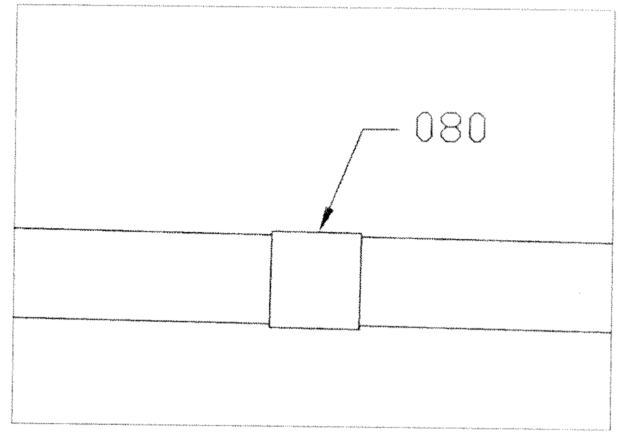
USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-024



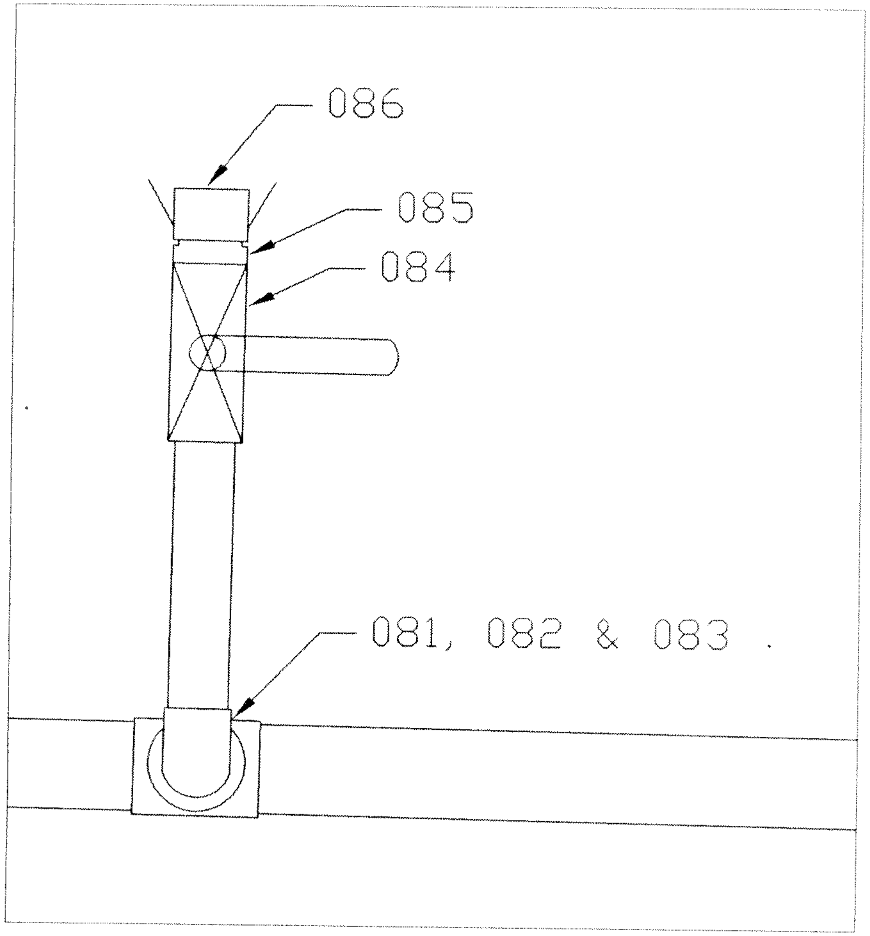


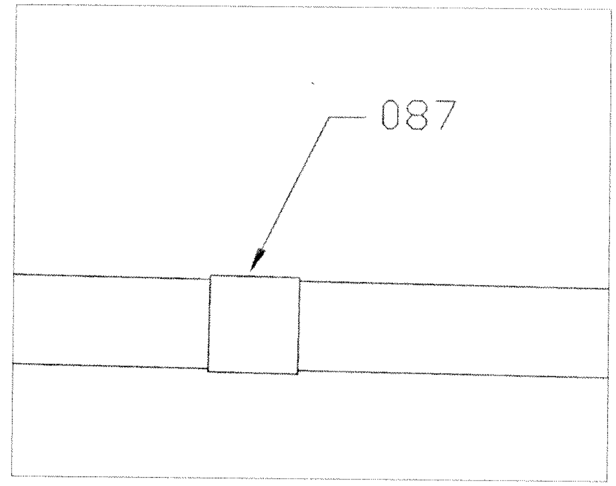
USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-025



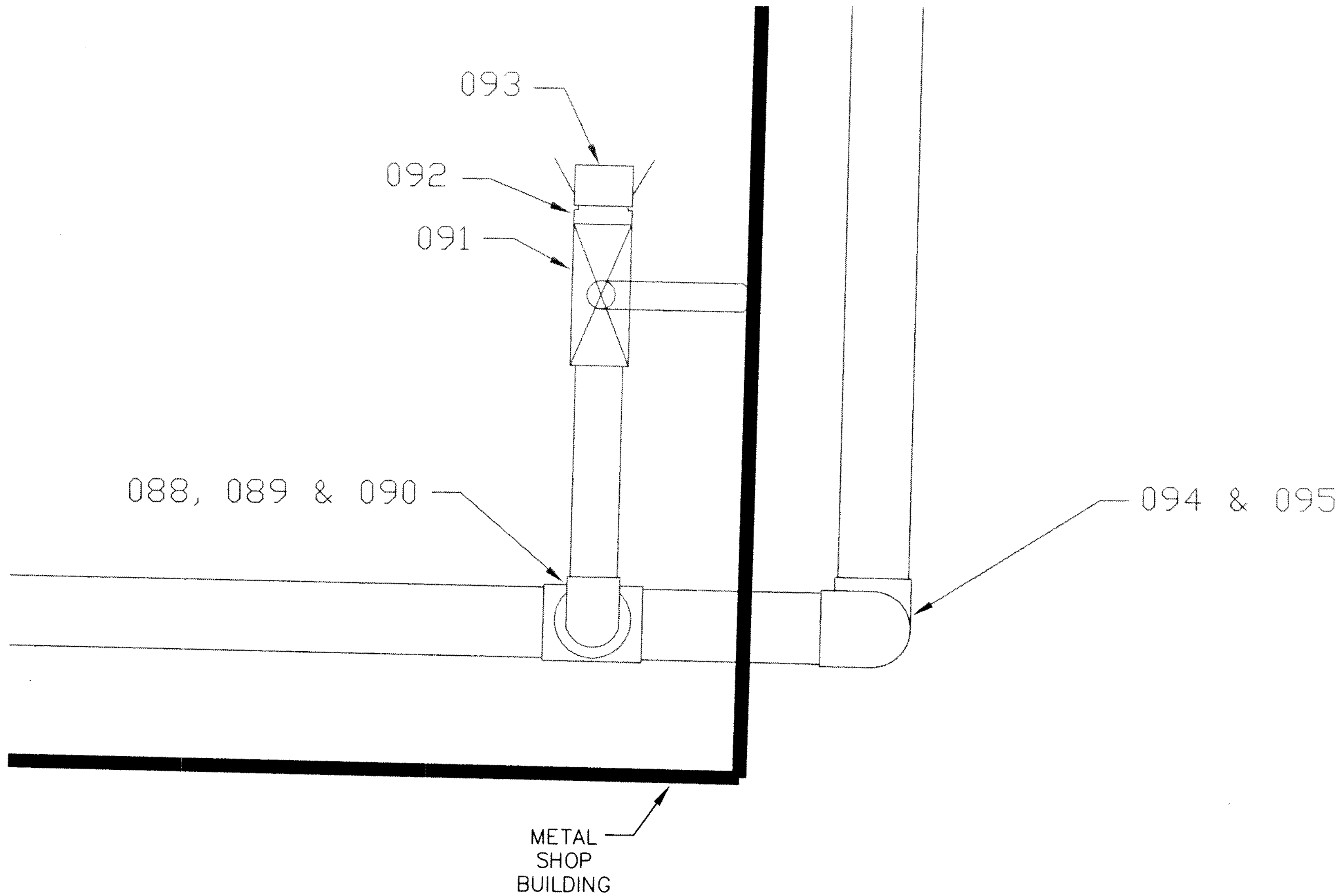


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-026

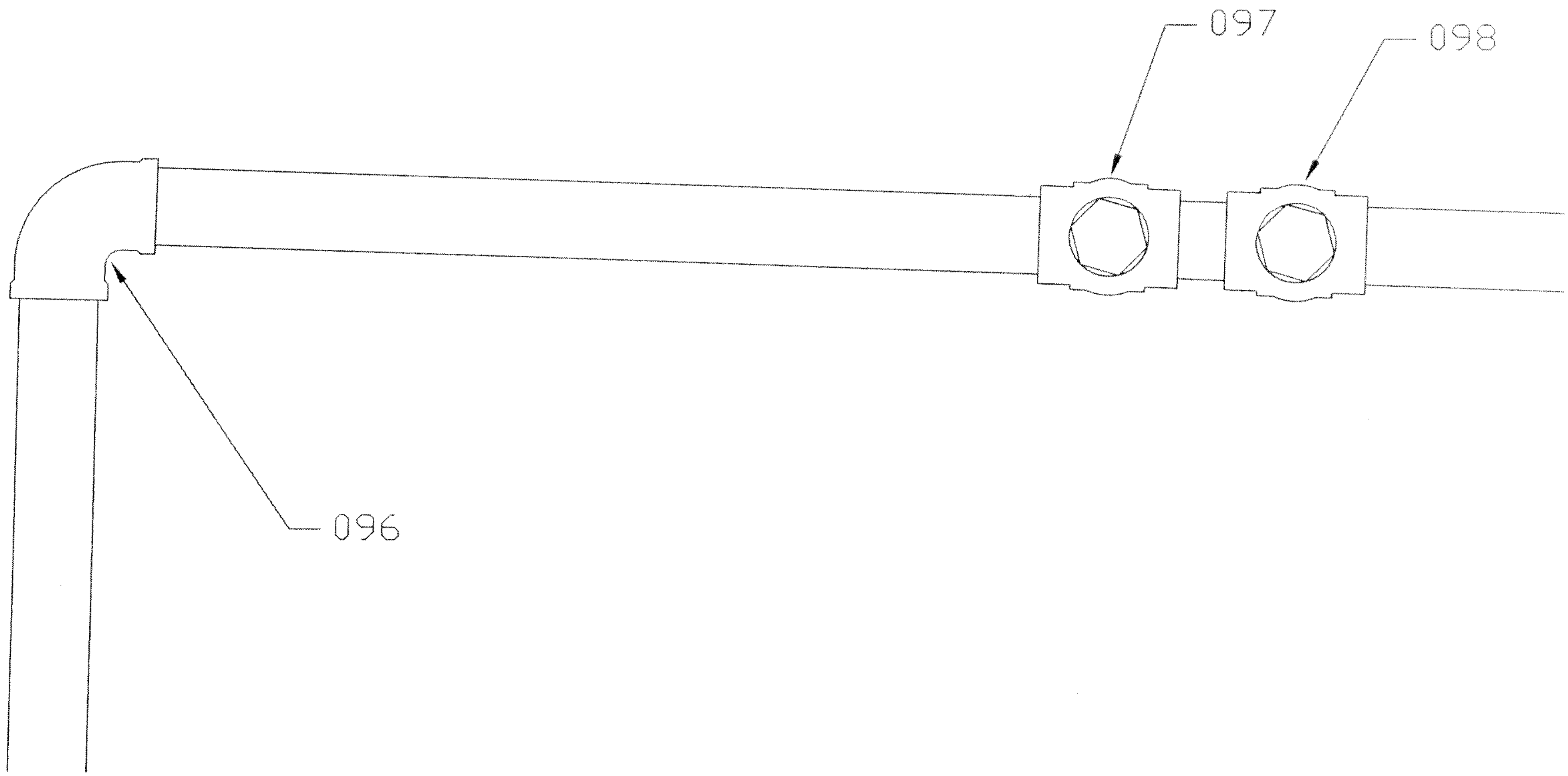


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-027

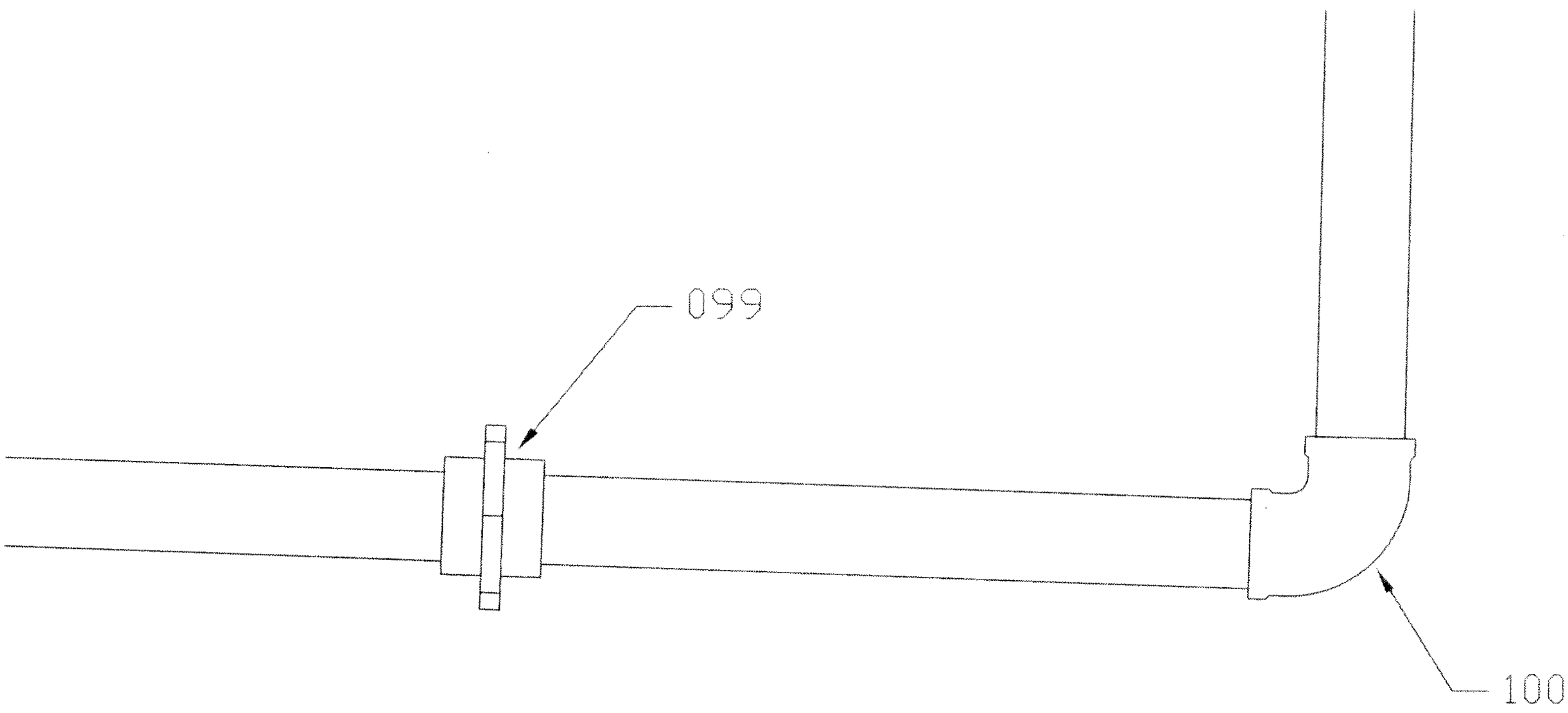


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-028

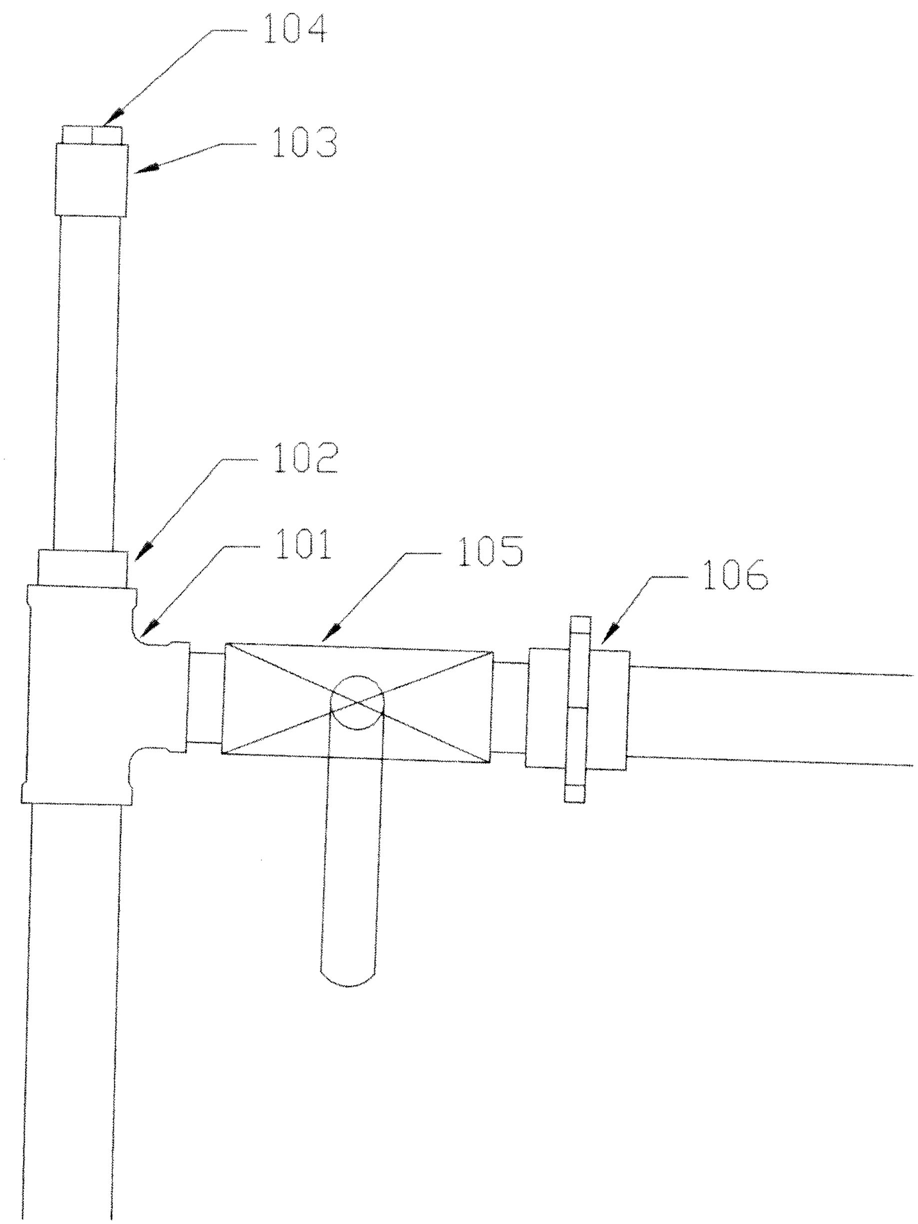


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-029

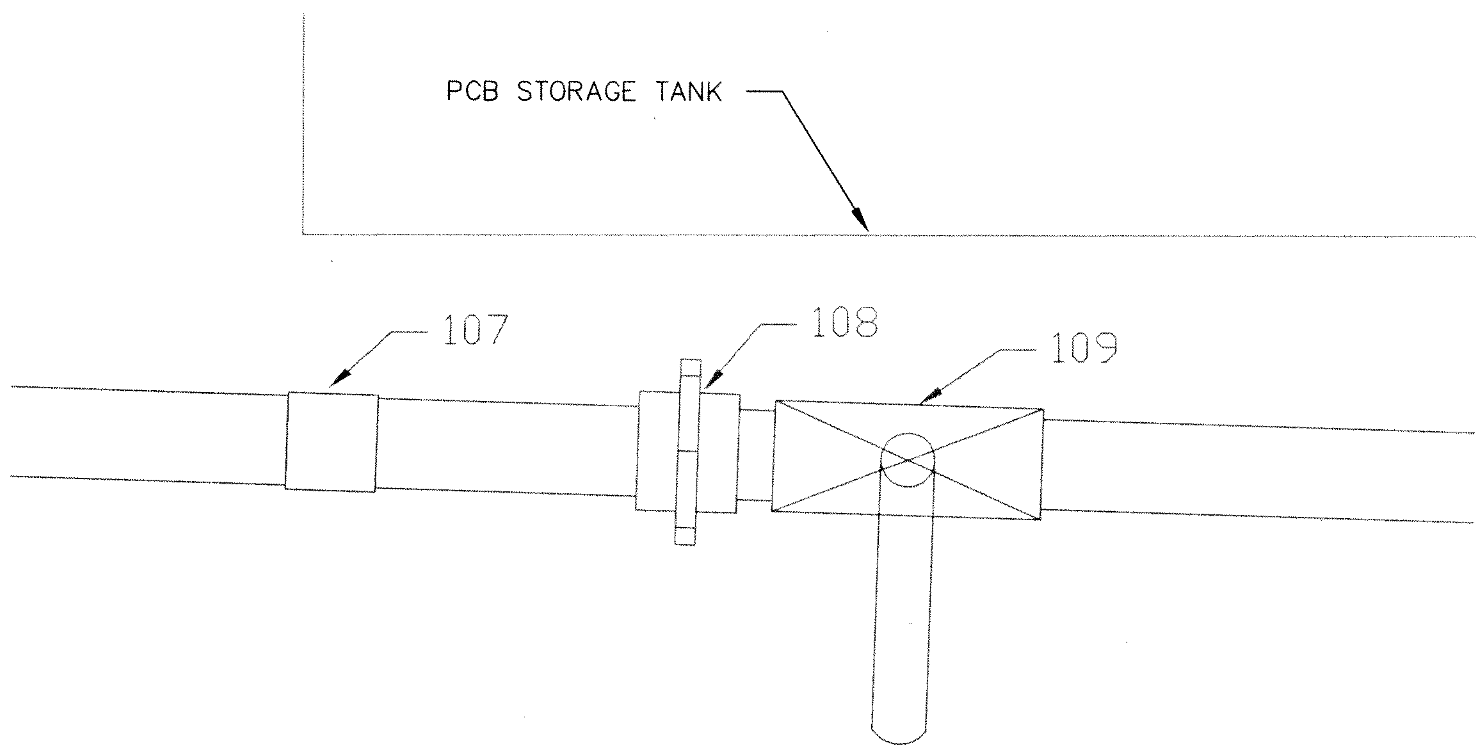


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-030

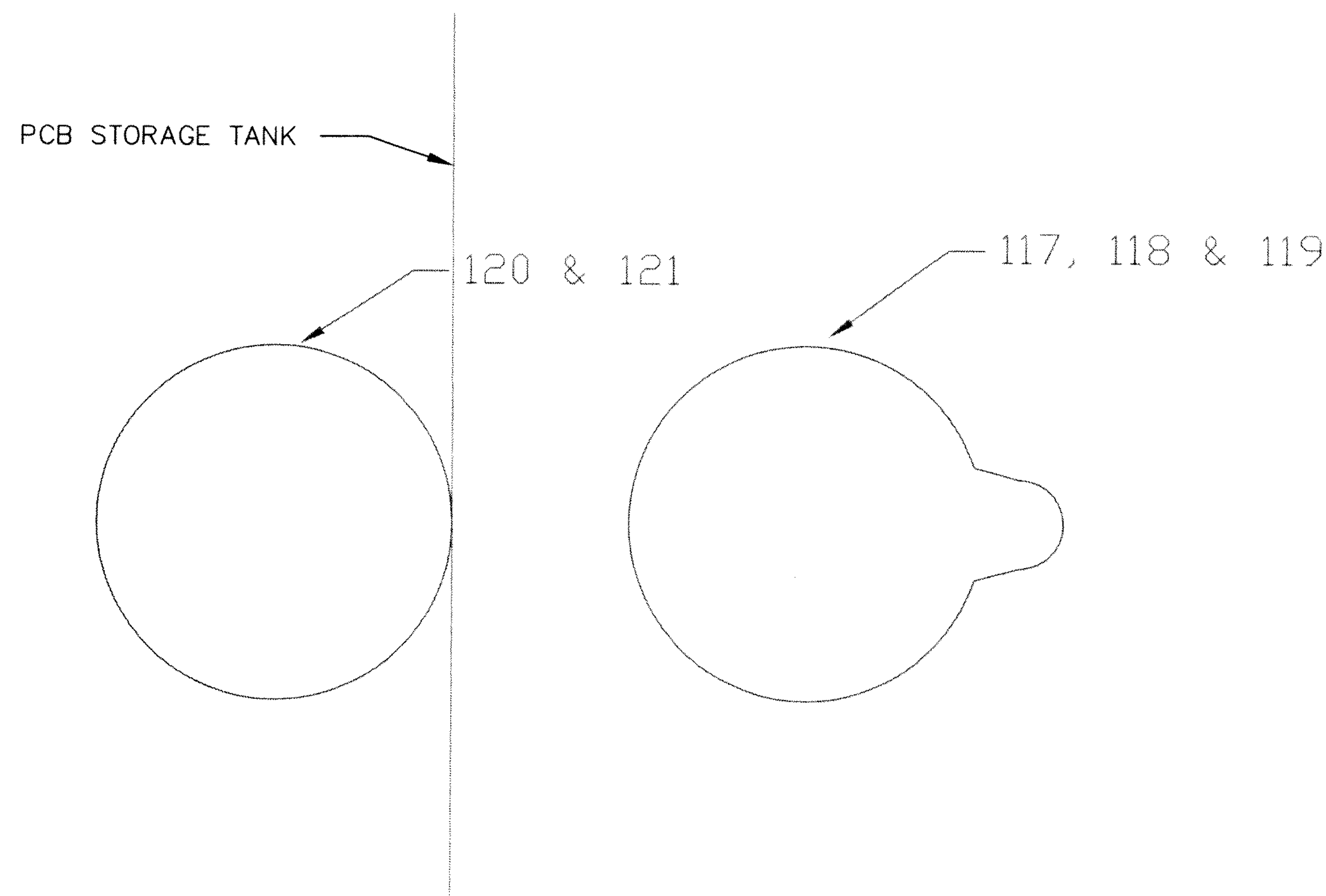


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-031



USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

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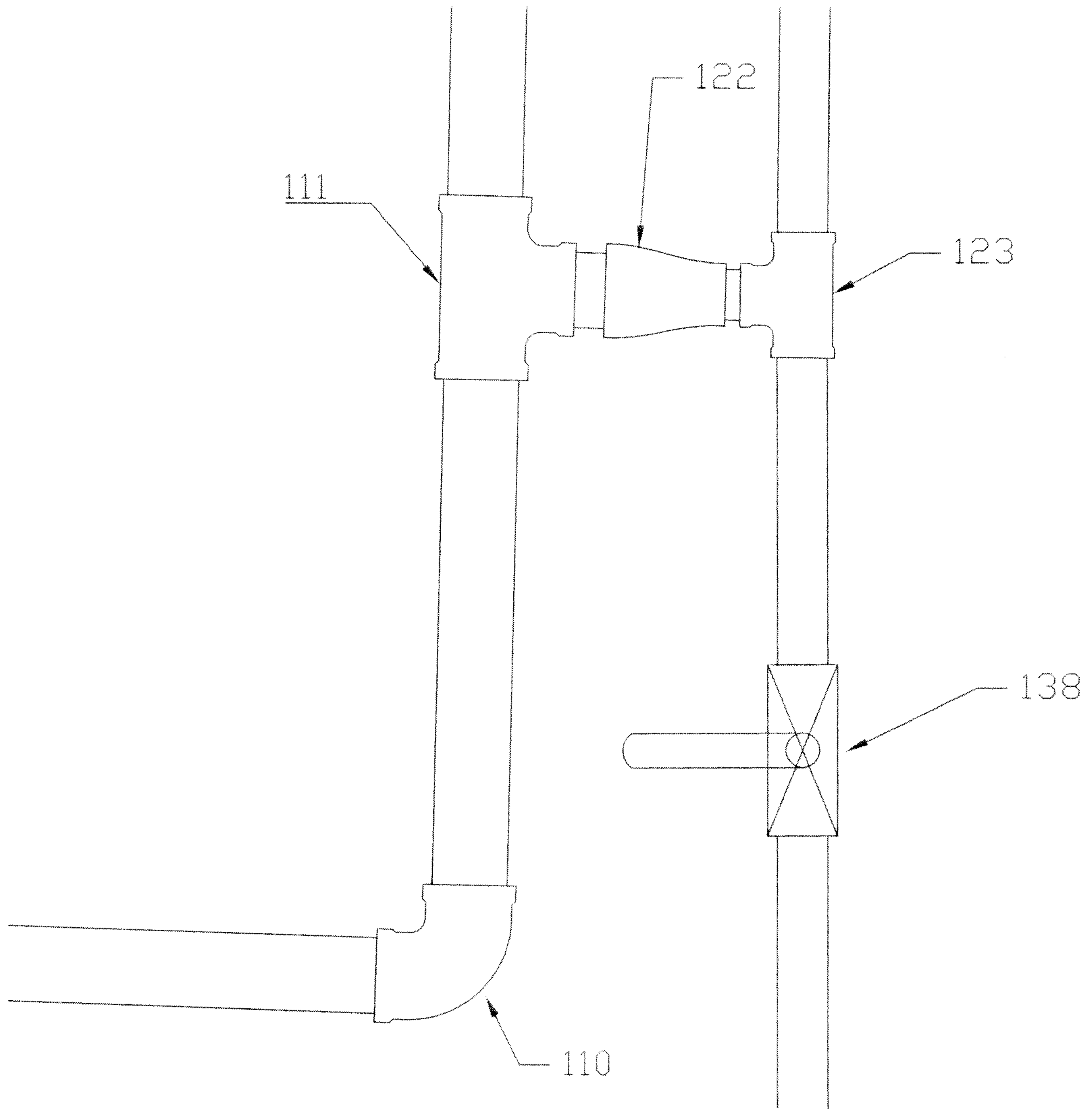
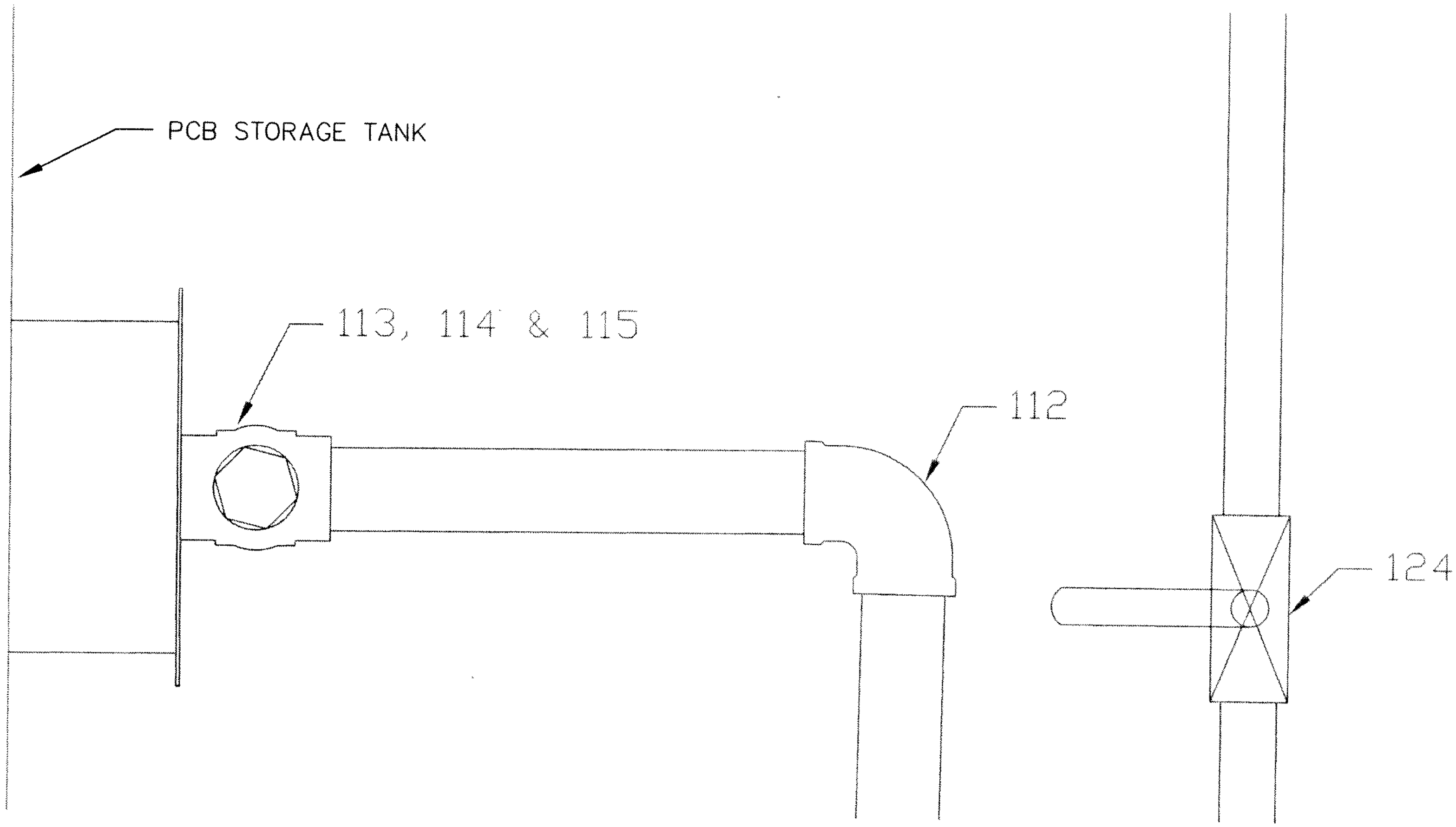


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-033



USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
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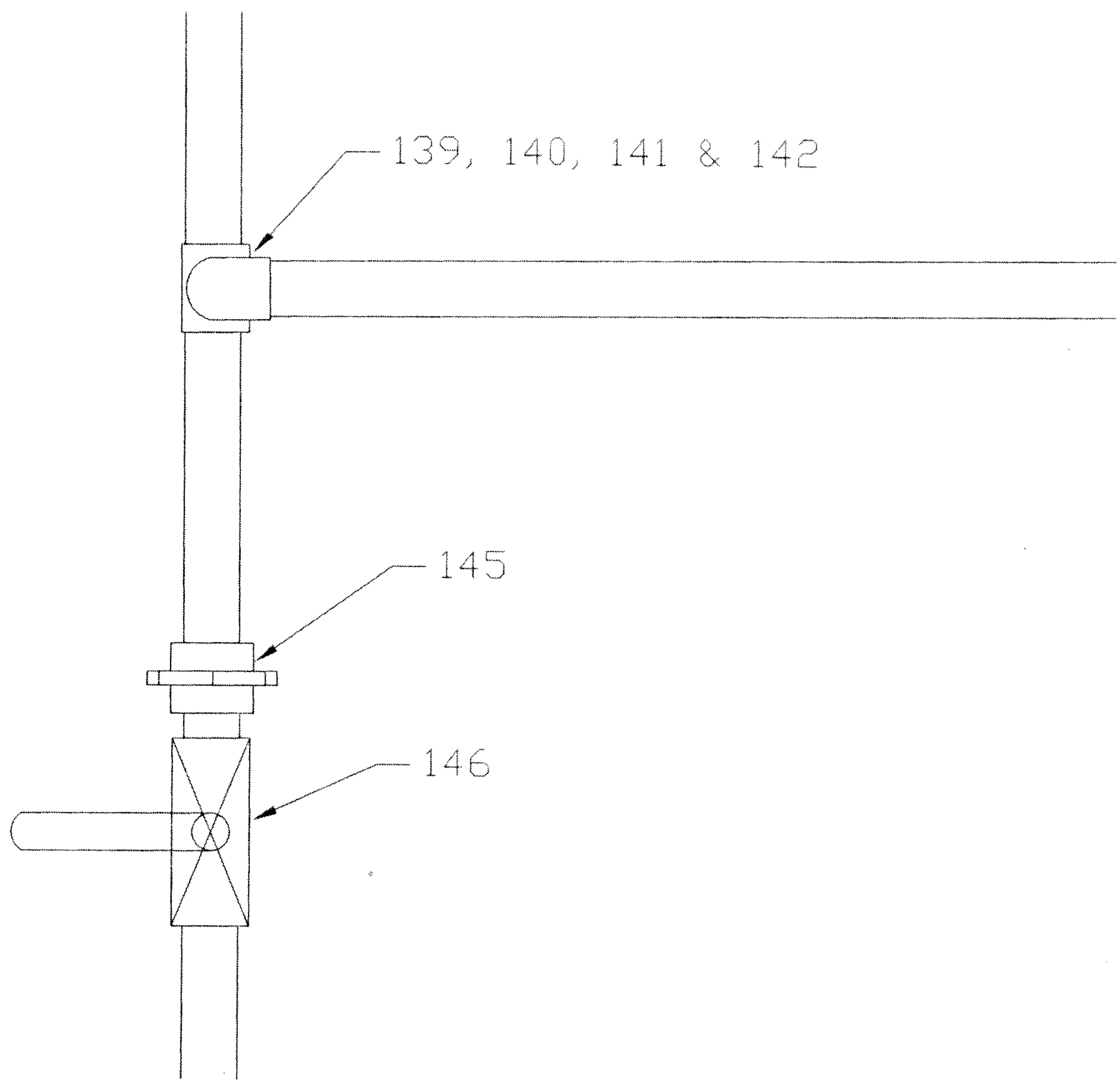
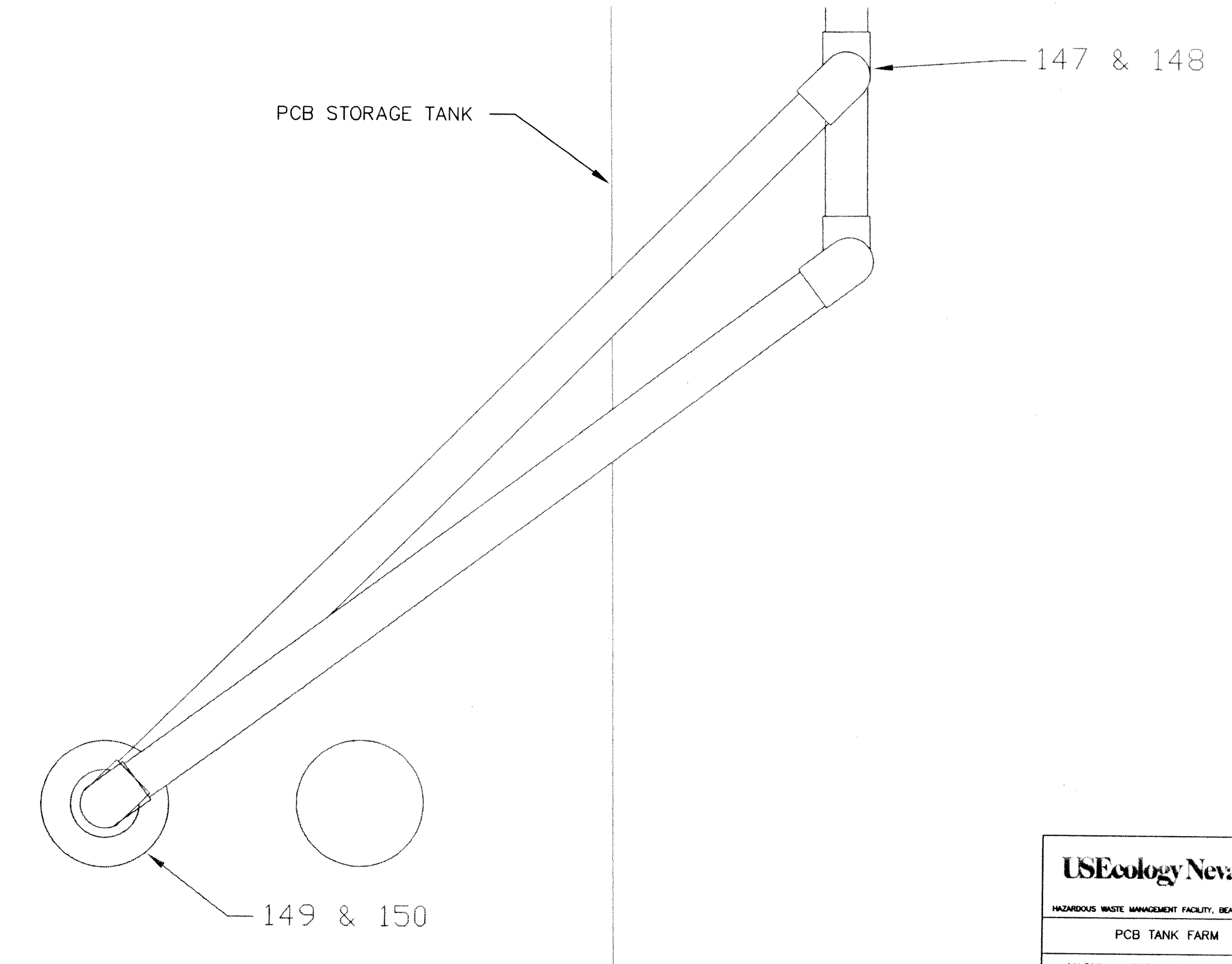


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-035

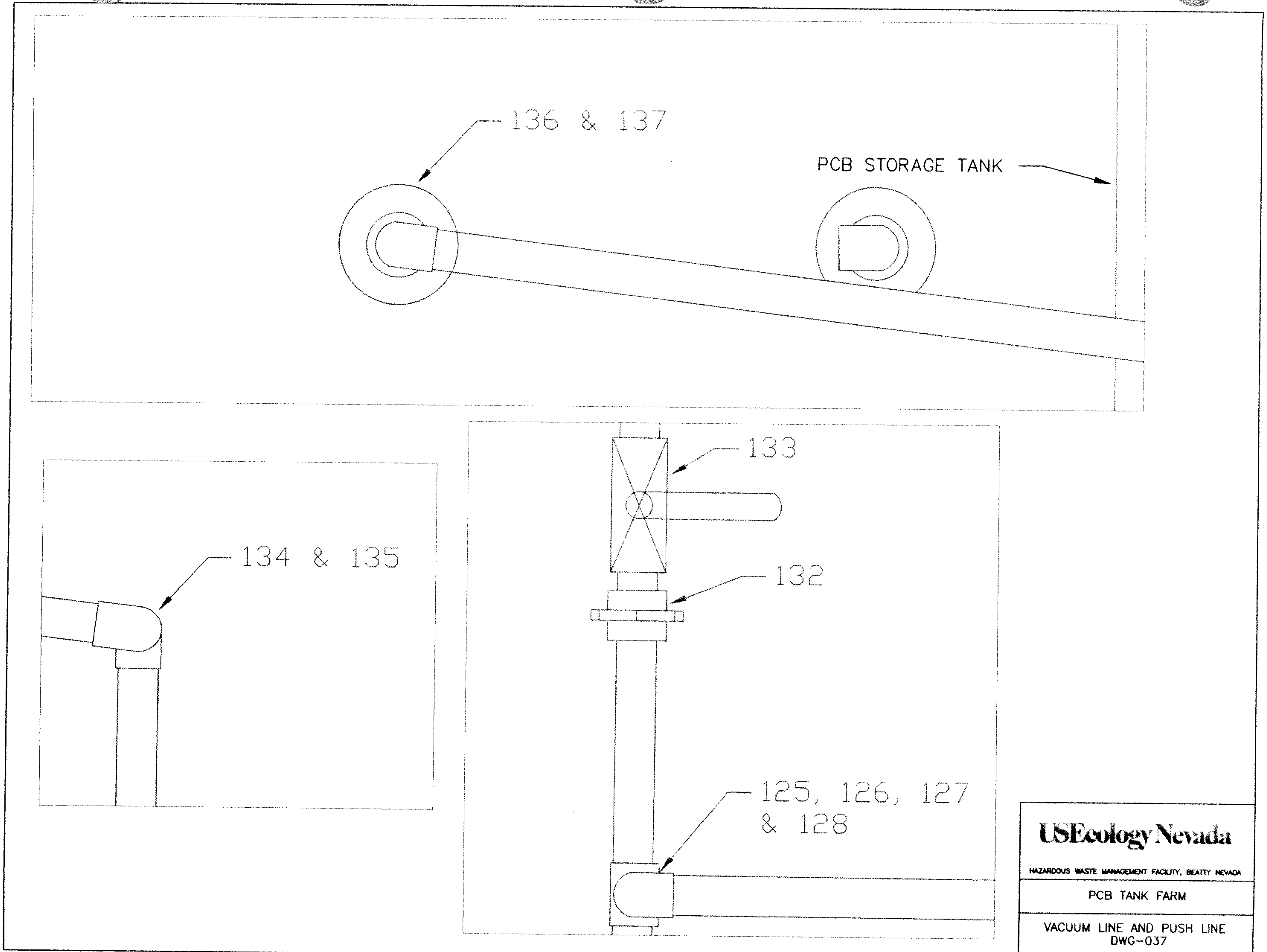


USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-036

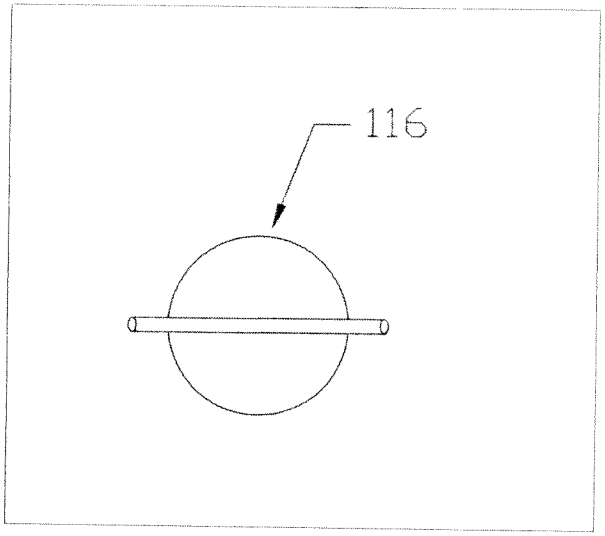


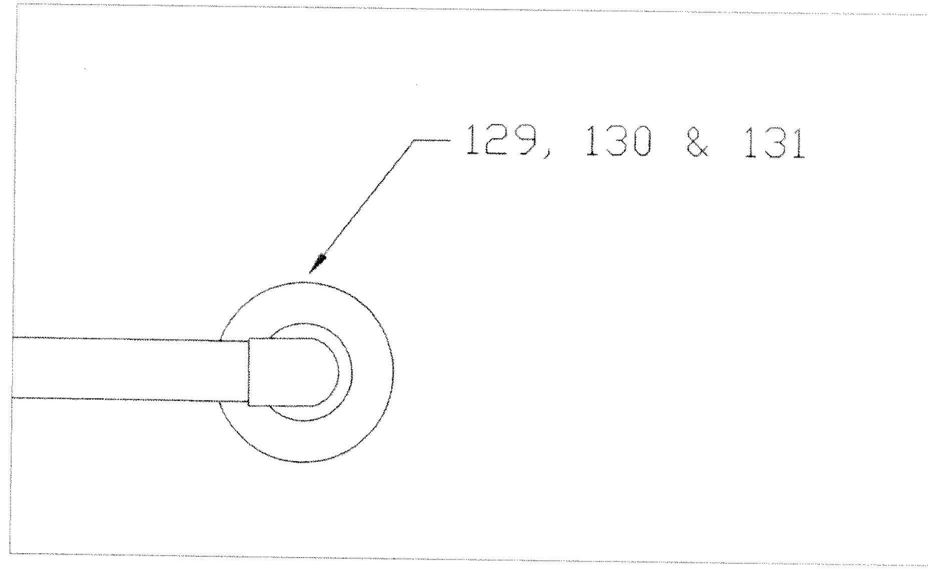
USEcology Nevada

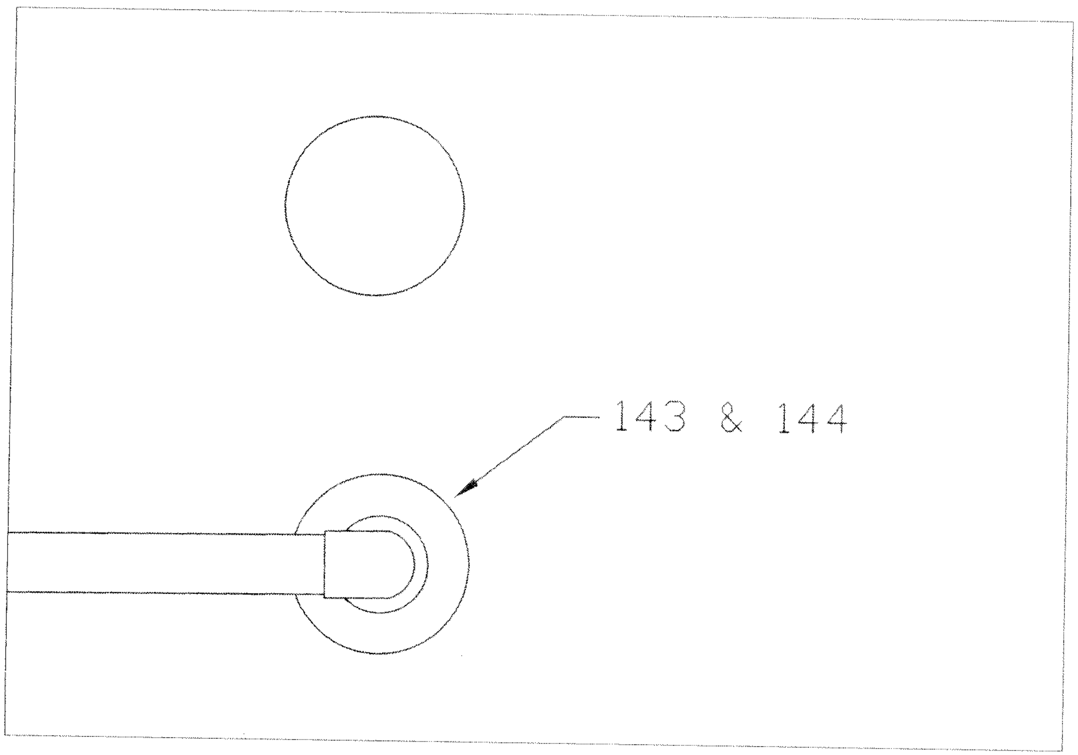
HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
DWG-037







USEcology Nevada

HAZARDOUS WASTE MANAGEMENT FACILITY, BEATTY NEVADA

PCB TANK FARM

VACUUM LINE AND PUSH LINE
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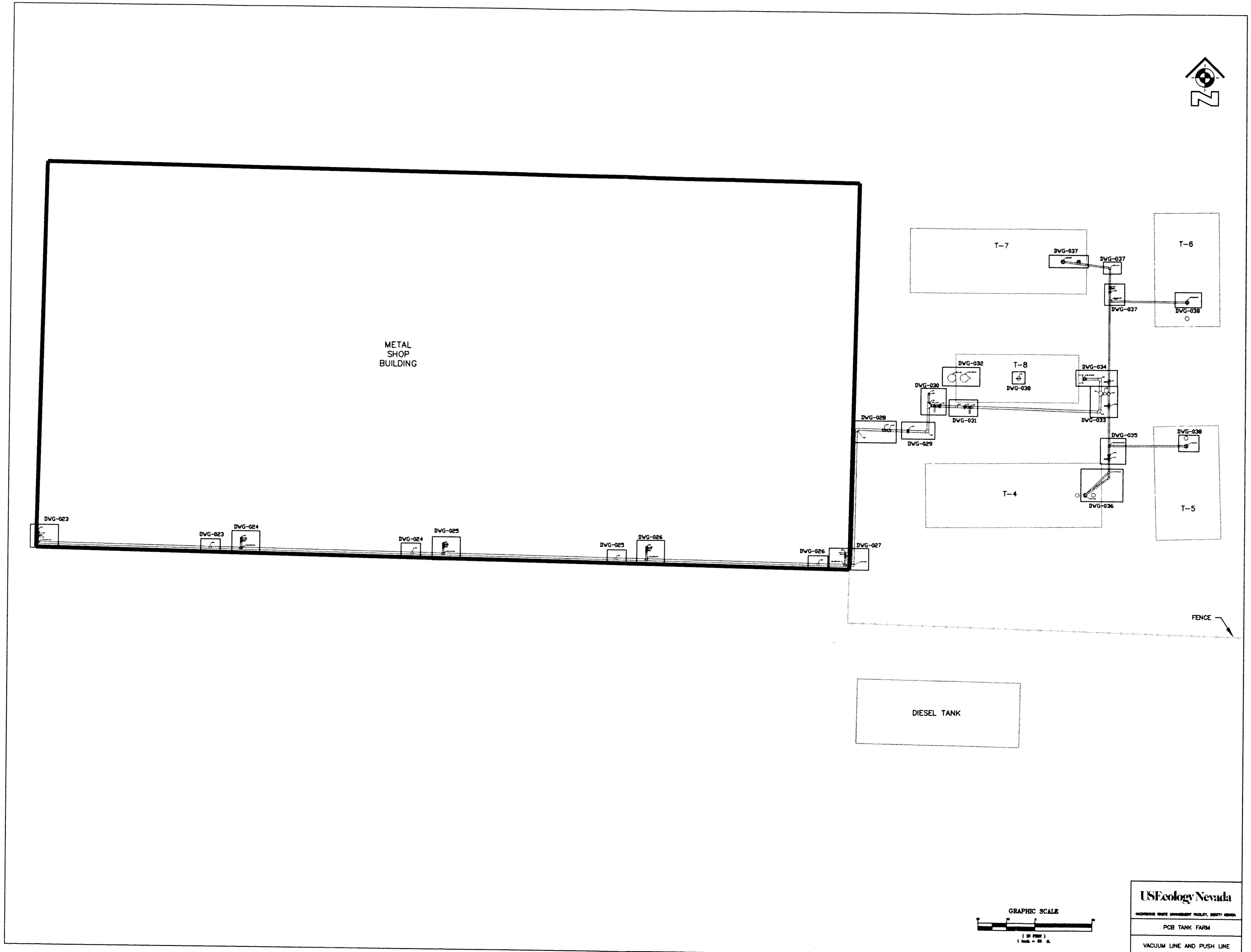
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DWG-024
DWG-024
DWG-025
DWG-025
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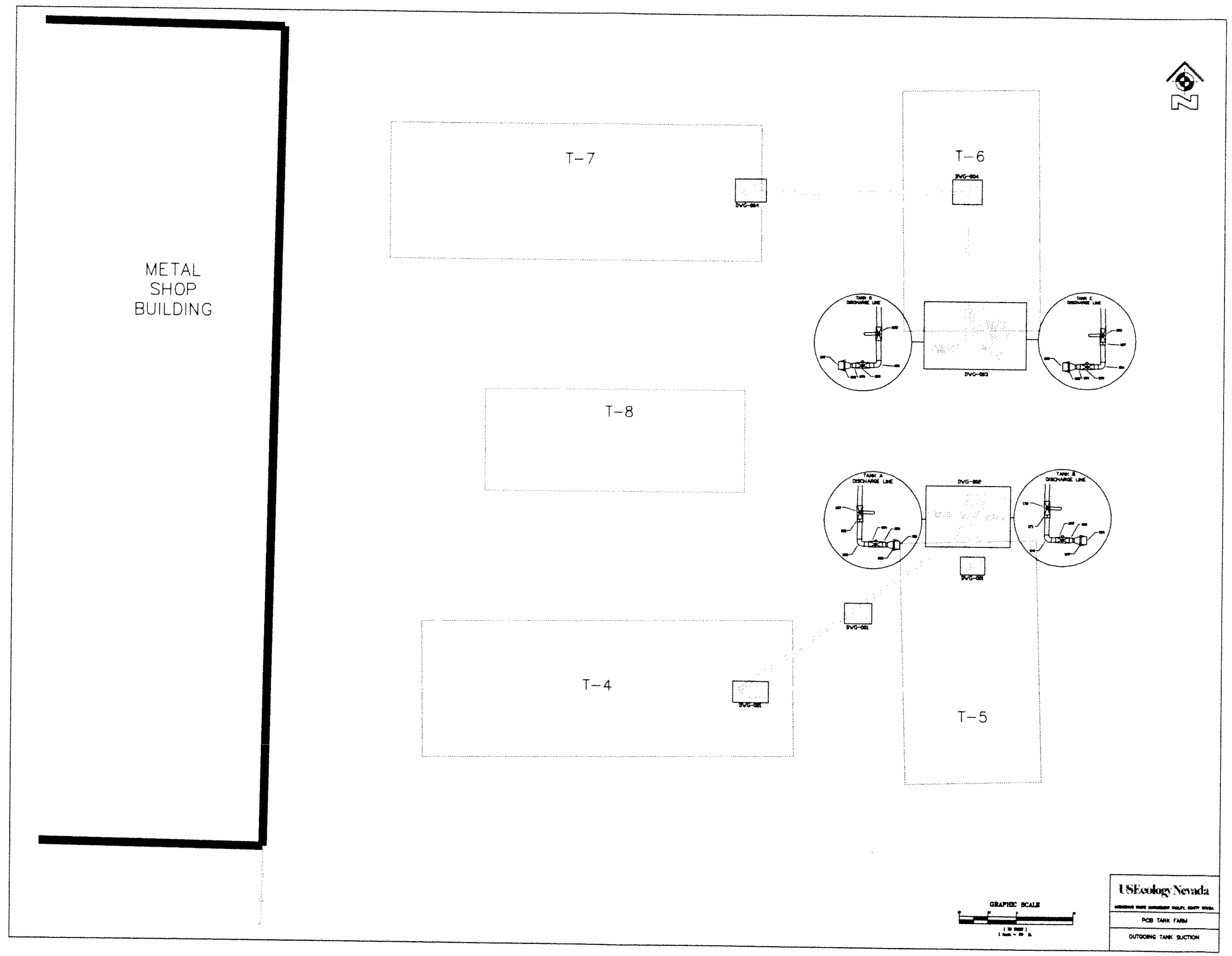
DWG-028
DWG-029
DWG-030
DWG-031
DWG-032
T-8
DWG-038
DWG-033
DWG-034
DWG-035
DWG-036
DWG-037
DWG-037
DWG-037
DWG-038
DWG-038
T-7
T-6
T-4
T-5
FENCE
DIESEL TANK
GRAPHIC SCALE
USEcology Nevada
PCB TANK FARM
VACUUM LINE AND PUSH LINE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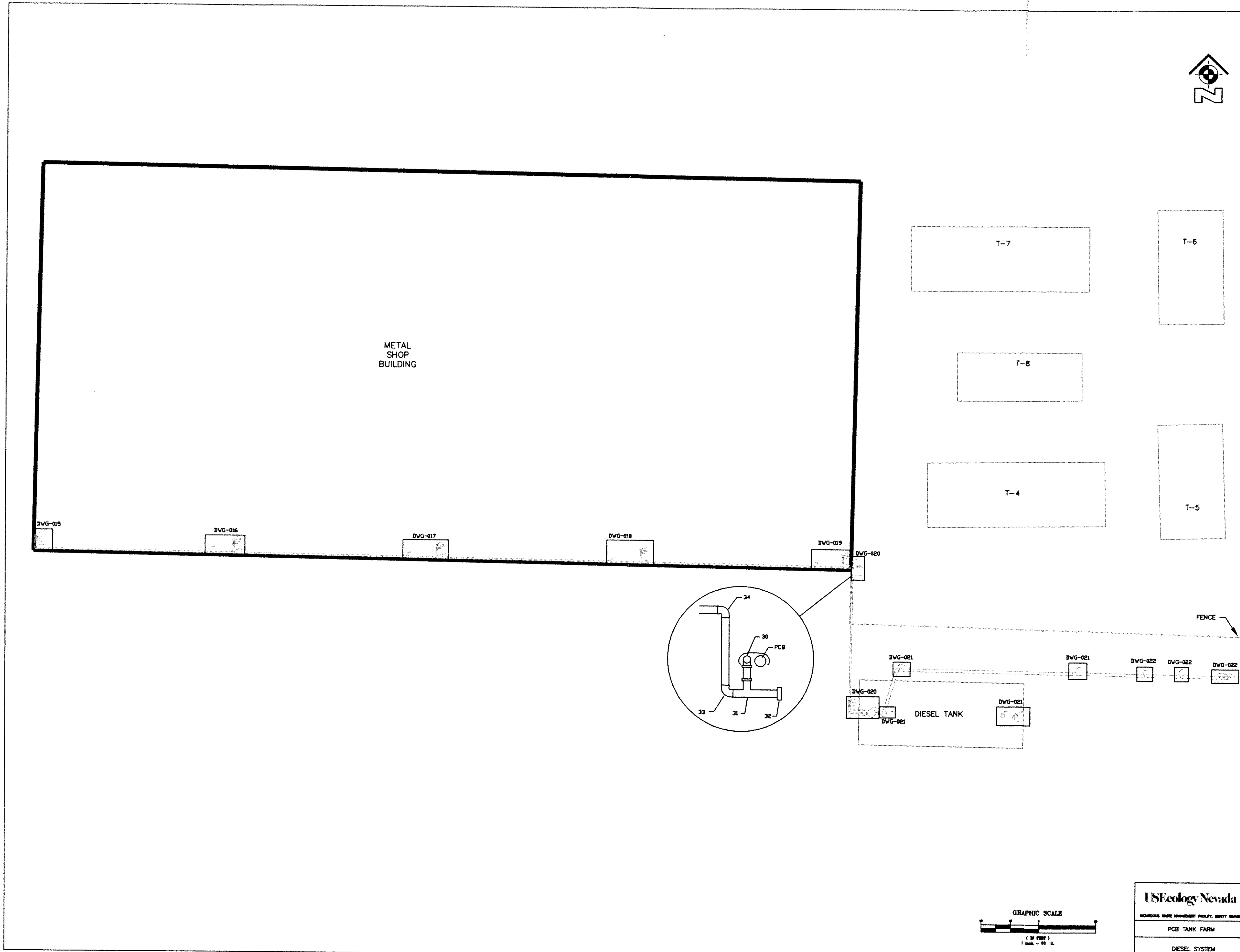
T-5
GRAPHIC SCALE
USEcology Nevada
PCB TANK FARM
OUTGOING TANK SUCTION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DWG-018
DWG-019
DWG-020
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T-4
T-5
FENCE
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DWG-021
DWG-022
DWG-022
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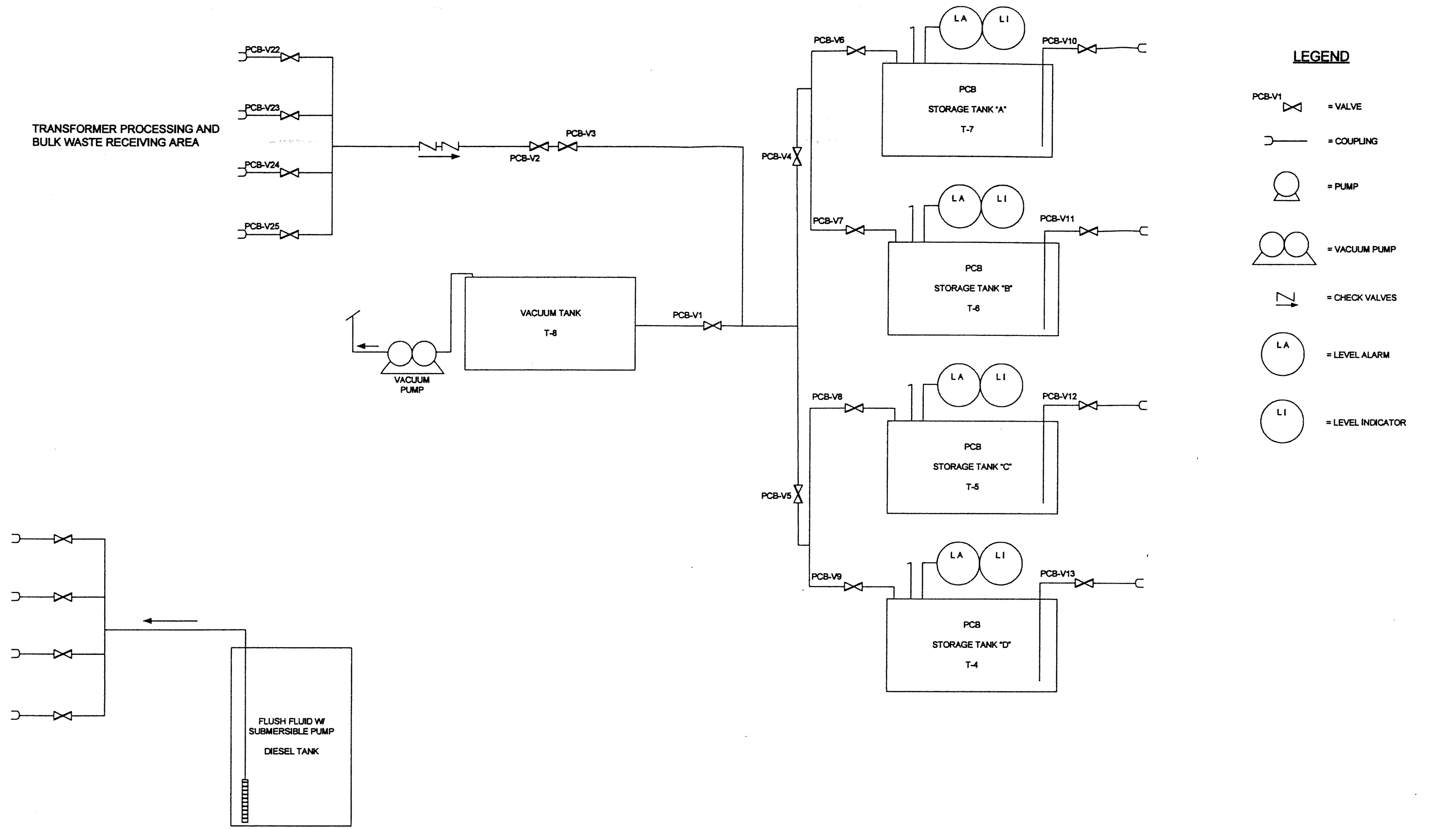
DWG-020
DWG-021
DIESEL TANK
DWG-021
GRAPHIC SCALE
USEcology Nevada
PCB TANK FARM
DIESEL SYSTEM



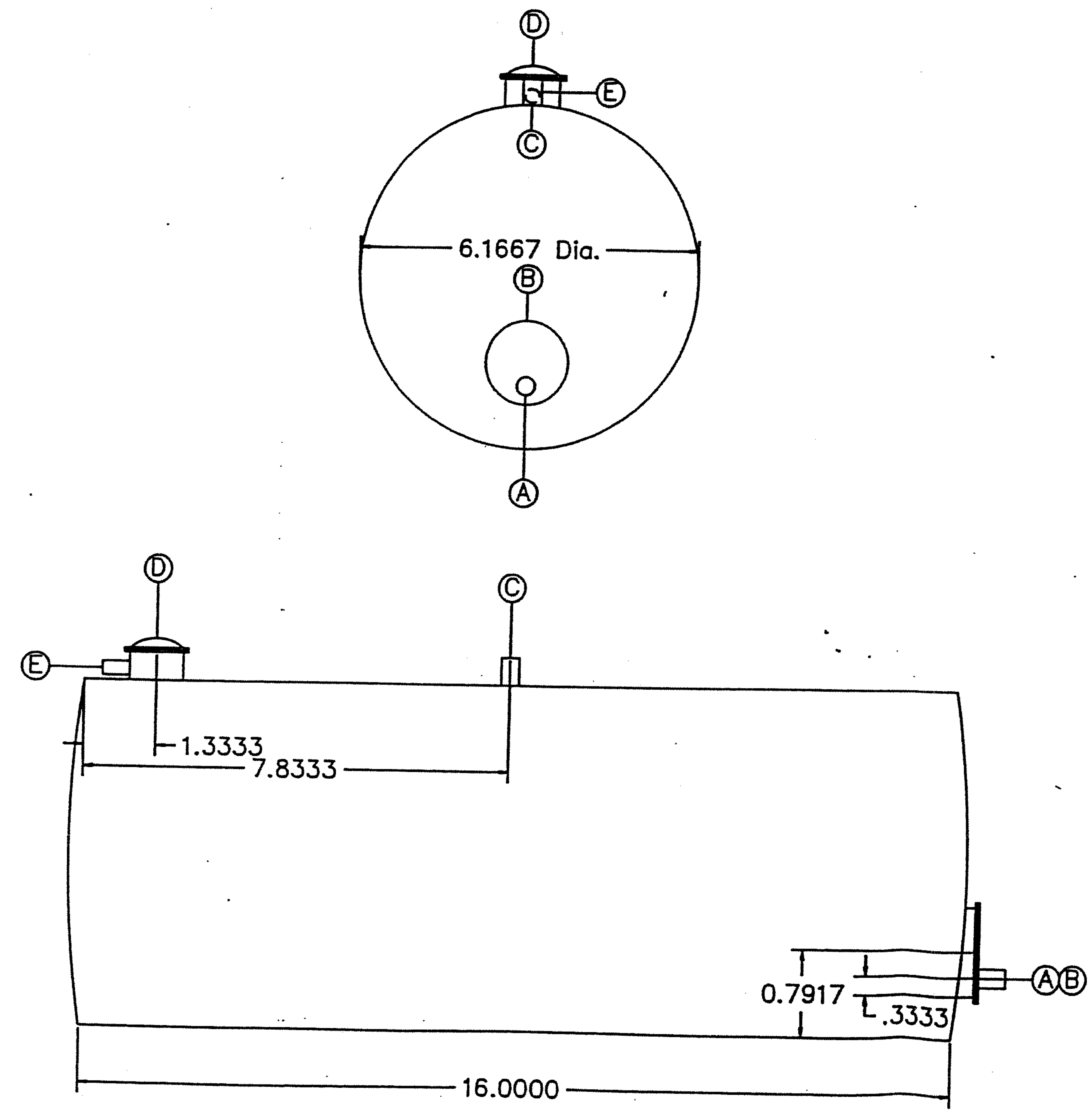
REV.	DESCRIPTION	DRWN. BY	APP'D BY	DATE
1	NUMBERED VALVES	MGM	PTJ	1/16/93
2	SYSTEM MODIFICATIONS	LAM	CAB	3/22/10

DRWN. BY	DATE	APP'D BY	DATE
MGM	5/18/87	PTJ	5/18/87

USEcology
an American Ecology company

US ECOLOGY INC.
HAZARDOUS WASTE MANAGEMENT FACILITY,
BEATTY NEVADA

PCB PROCESSING SYSTEM



ALL DIMENSIONS ARE DECIMALS OF A FOOT

MARK	SERIVCE	SIZE	RATING	TYPE	O.S. | I.S. PROJECT	REMARKS
A	IN/OUTLET	4"	3000	CPLG		
B	MANWAY	18"				
C	SPARE	4"	3000	CPLG		
D	HATCH	12"				
E	VACUUM	3"				

DESIGN DATA	DESIGN	MAX. A WORKING			HYDRO. TEST
PRES. PSIG.	FULL VAC.				
TEMP. MAX./MIN.	AMB.				
LIMITED BY					
WIND PRES. lbs./sq.ft.		CORROSION ALLOWANCE			
SEISMIC COEFFIC.		RADIOGRAPHIC EXAM.			
MEDIUM		LONG JOINT EFFIC.			
SPECIFIC GRAV.	1.5	POST WELD HEAT			
VOLUME GAL.	3000	TREATMENT – 1100° F.			

DATA NOT SHOWN ARE NOT FACTOR OF DESIGN

MATERIAL					
SHELL	MAT'L	C.S.	HEAD	MAT'L TYPE	C.S.
	THK.	0.25"		THK.	0.25"
FLANGE			SKIRT		
NOZZLE NECK			BASE		
BOLTING			ANCH. BOLT		
COUPLING			SADDLES		
WELD FTG.					
GASKETS					

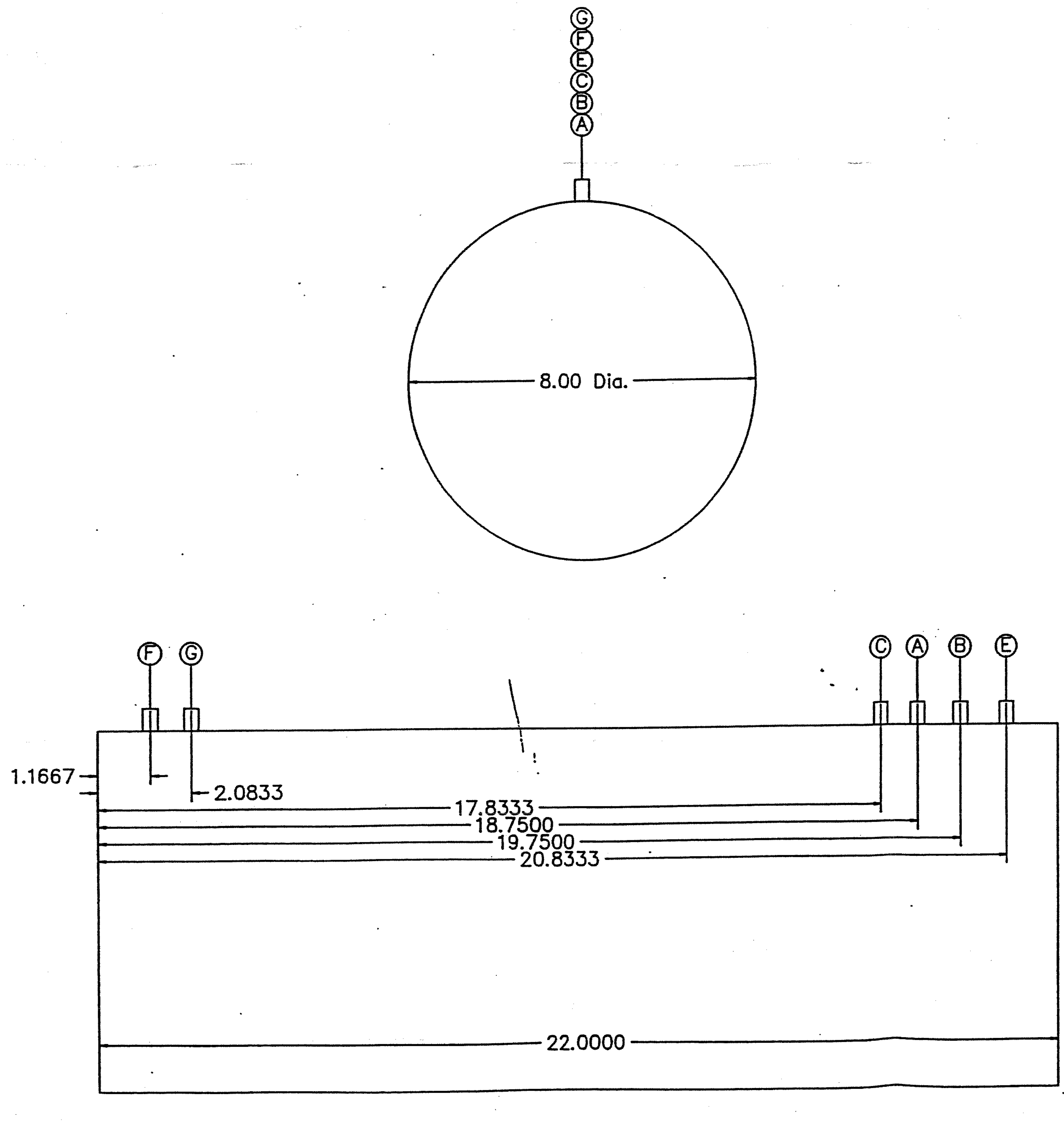
SHELL DIA.	6.1667'	SHELL LENGTH	16.0'
PAINT			
INSULATION			
LOCATION			
VESSELS REQUIRED		APPROX. FULL OPERATING WT. LBS	

REVISIONS

Rev. No.	Description	Appr. By	Drawn By	Date

VACUUM TANK
for
P C B PROCESSING SYSTEM

Drawn By	MOM	Project No.	050022
Appr. By	PTJ	Revision No.	000000
Date	6-1-87	Drawing No.	NV 870002
Scale	NONE	Sheet 2 of	6



ALL DIMENSIONS ARE DECIMALS OF A FOOT

MARK	SERIVCE	SIZE	RATING	TYPE	O.S. / I.S. PROJECT	REMARKS
A	OUTLET	4"	3000	CPLG		
B	INLET	4"	3000	CPLG		
C	VENT	4"	3000	CPLG		
E	LEVEL	4"	3000	CPLG		
F	LEVEL	4"	3000	CPLG		
G	SPARE	4"	3000	CPLG		

DESIGN DATA	DESIGN	MAX. A WORKING		HYDRO. TEST
PRES. PSIG.	ATM.			
TEMP. MAX./MIN.	AMB.			
LIMITED BY				
WIND PRES. lbs./sq.ft.		CORROSION ALLOWANCE		
SEISMIC COEFFIC.		RADIOGRAPHIC EXAM.		
MEDIUM		LONG JOINT EFFIC.		
SPECIFIC GRAV.	1.5	POST WELD HEAT		
VOLUME GAL.	7500	TREATMENT – 1100° F.		

DATA NOT SHOWN ARE NOT FACTOR OF DESIGN

MATERIAL				
SHELL	MAT'L. C.S.	HEAD	MAT'L.	C.S.
	THK. 0.25"		TYPE	
			THK.	0.25"
FLANGE		SKIRT		
NOZZLE NECK		BASE		
BOLTING		ANCH. BOLT		
COUPLING		SADDLES		
WELD FTG.				
GASKETS				
SHELL DIA.	8.0'	SHELL LENGTH	22.0'	

PAINT

INSULATION

LOCATION

VESSELS REQUIRED | APPROX. FULL OPERATING WT. LBS

Rev. No.	Description	Appr. By	Drawn By	Date

REVISIONS

STORAGE TANK A
for
P C B PROCESSING SYSTEM

Drawn By	MOM	Project No.	050022
Appr. By	PTJ	Revision No.	000000
Date	6-1-87	Drawing No.	NV 870002
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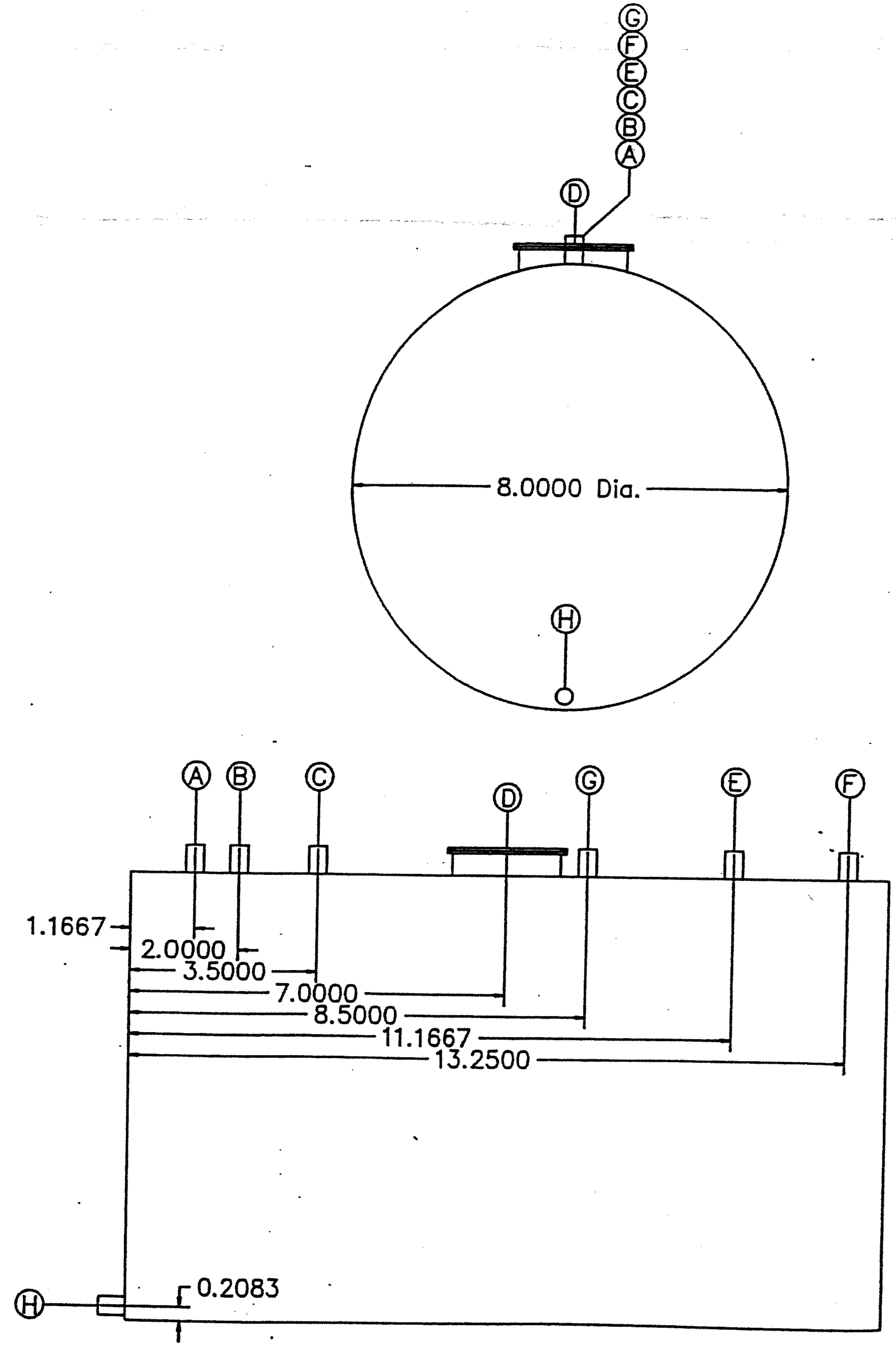

ALL DIMENSIONS ARE DECIMALS OF A FOOT

MARK	SERIVCE	SIZE	RATING	TYPE	O.S. / I.S. PROJECT	REMARKS
A	OUTLET	4"	3000	CPLG		
B	INLET	4"	3000	CPLG		
C	VENT	4"	3000	CPLG		
D	MANWAY	24"				
E	LEVEL	4"	3000	CPLG		
F	LEVEL	4"	3000	CPLG		
G	SPARE	4"	3000	CPLG		
H	DRAIN	31/2"	3000	CPLG		

DESIGN DATA	DESIGN	MAX. A WORKING		HYDRO. TEST
PRES. PSIG.	ATM.			
TEMP. MAX./MIN.	AMB.			
LIMITED BY				
WIND PRES. lbs./sq.ft.		CORROSION ALLOWANCE		
SEISMIC COEFFIC.		RADIOGRAPHIC EXAM.		
MEDIUM		LONG JOINT EFFIC.		
SPECIFIC GRAV.	1.5	POST WELD HEAT		
VOLUME GAL.	5000	TREATMENT – 1100° F.		

DATA NOT SHOWN ARE NOT FACTOR OF DESIGN

MATERIAL					
SHELL	MAT'L	C.S.	HEAD	MAT'L	C.S.
	THK.	0.25"		TYPE	
				THK.	0.25"
FLANGE			SKIRT		
NOZZLE NECK			BASE		
BOLTING			ANCH. BOLT		
COUPLING			SADDLES		
WELD FTG.					
GASKETS					
SHELL DIA.	8.0'		SHELL LENGTH	14.0'	

PAINT

INSULATION

LOCATION

VESSELS REQUIRED | APPROX. FULL OPERATING WT. LBS

Rev. No.	Description	Appr. By	Drawn By	Date

REVISIONS

STORAGE TANK B
for
P C B PROCESSING SYSTEM

Drawn By	MOM	Project No.	050022
Appr. By	PTJ	Revision No.	000000
Date	6-1-87	Drawing No.	NV 870002
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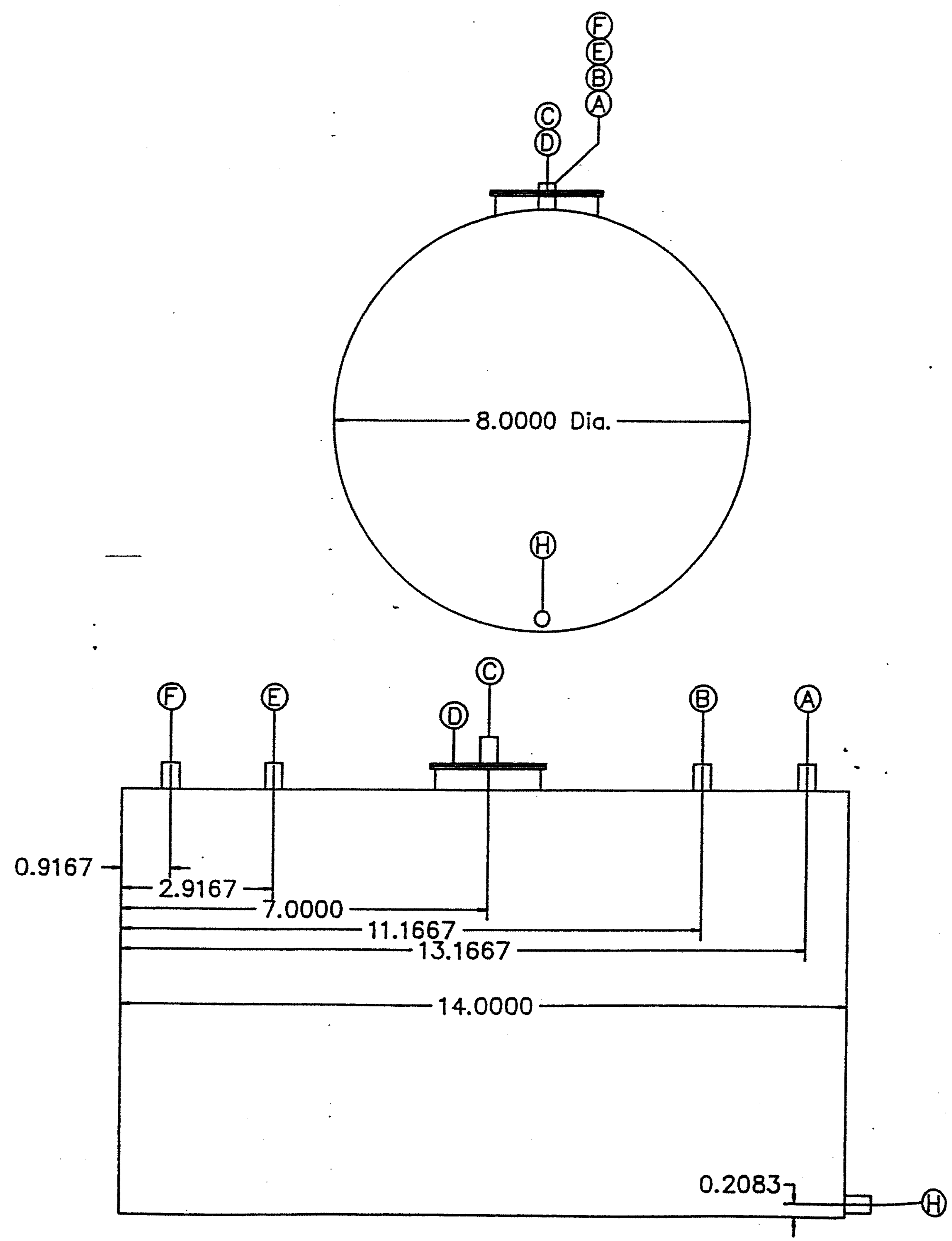

ALL DIMENSIONS ARE DECIMALS OF A FOOT

MARK	SERIVCE	SIZE	RATING	TYPE	O.S. PROJECT	I.S. PROJECT	REMARKS
A	OUTLET	4"	3000	CPLG			
B	INLET	4"	3000	CPLG			
C	VENT	4"	3000	CPLG			
D	MANWAY	24"					
E	LEVEL	4"	3000	CPLG			
F	LEVEL	4"	3000	CPLG			
H	DRAIN	31/2"	3000	CPLG			

DESIGN DATA		DESIGN	MAX. A WORKING		HYDRO. TEST
	PRES. PSIG.	ATM.			
	TEMP. MAX./MIN.	AMB.			
	LIMITED BY				
	WIND PRES. lbs./sq.ft.		CORROSION ALLOWANCE		
	SEISMIC COEFFIC.		RADIOGRAPHIC EXAM.		
	MEDIUM		LONG JOINT EFFIC.		
	SPECIFIC GRAV.	1.5	POST WELD HEAT		
	VOLUME GAL.	5000	TREATMENT – 1100° F.		

DATA NOT SHOWN ARE NOT FACTOR OF DESIGN

MATERIAL						
		MAT'L	C.S.		MAT'L	C.S.
	SHELL	THK.	0.25"	HEAD	TYPE	
					THK.	0.25"
	FLANGE			SKIRT		
	NOZZLE NECK			BASE		
	BOLTING			ANCH. BOLT		
	COUPLING			SADDLES		
	WELD FTG.					
	GASKETS					

SHELL DIA.	8.0'	SHELL LENGTH	14.0'
PAINT			
INSULATION			
LOCATION			
VESSELS REQUIRED		APPROX. FULL OPERATING WT. LBS	

Rev. No.	Description	Appr. By	Drawn By	Date

REVISIONS

STORAGE TANK C
for
P C B PROCESSING SYSTEM

Drawn By	MOM	Project No.	050022
Appr. By	PTJ	Revision No.	000000
Date	6-1-87	Drawing No.	NV 870002
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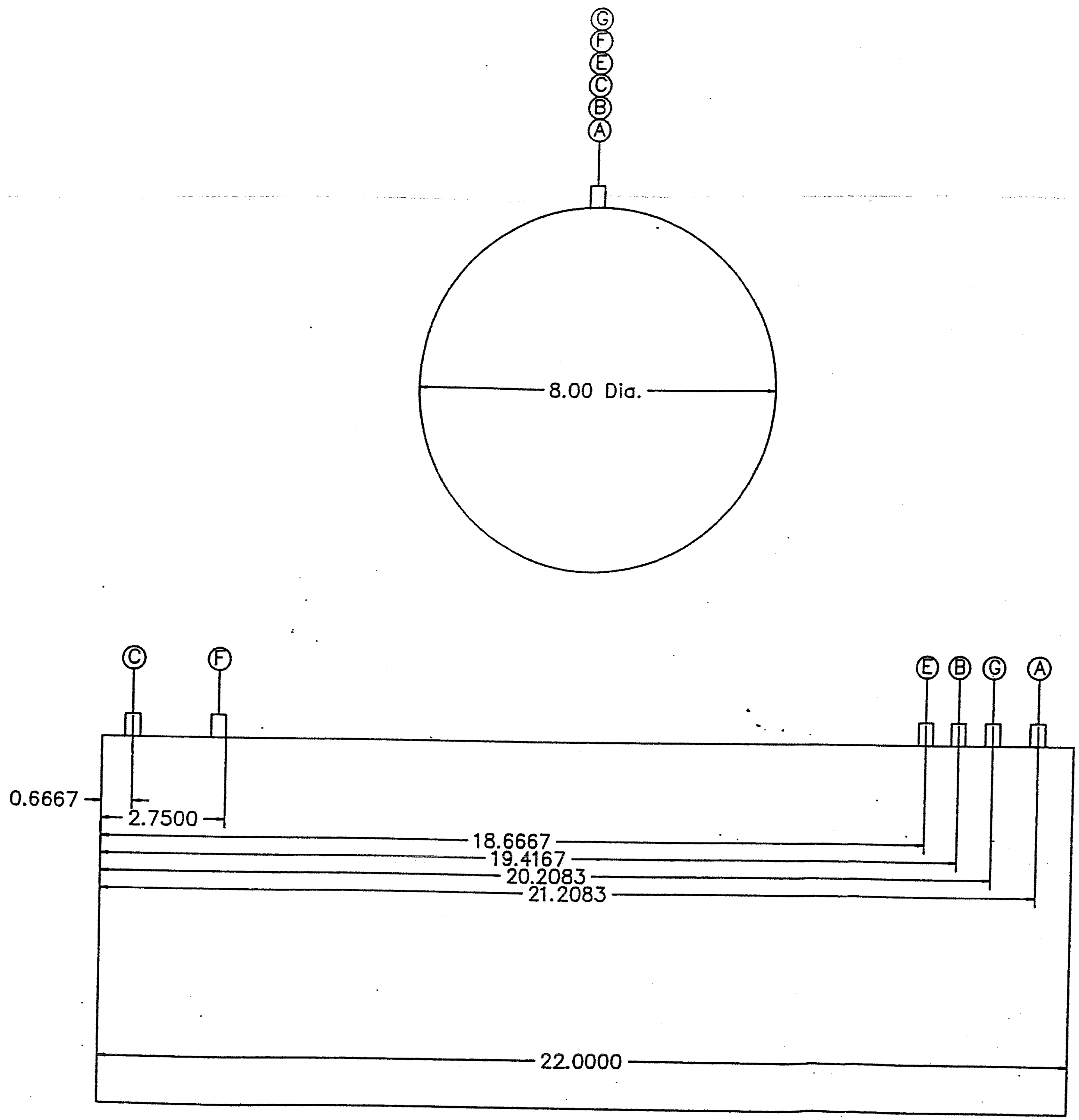


ALL DIMENSIONS ARE DECIMALS OF A FOOT

MARK	SERIVCE	SIZE	RATING	TYPE	O.S. / I.S. PROJECT	REMARKS
A	OUTLET	4"	3000	CPLG		
B	INLET	4"	3000	CPLG		
C	VENT	4"	3000	CPLG		
E	LEVEL	4"	3000	CPLG		
F	LEVEL	4"	3000	CPLG		
G	SPARE	4"	3000	CPLG		

DESIGN DATA	DESIGN	MAX. A WORKING		HYDRO. TEST
PRES. PSIG.	ATM.			
TEMP. MAX./MIN.	AMB.			
LIMITED BY				
WIND PRES. lbs./sq.ft.		CORROSION ALLOWANCE		
SEISMIC COEFFIC.		RADIOGRAPHIC EXAM.		
MEDIUM		LONG JOINT EFFIC.		
SPECIFIC GRAV.	1.5	POST WELD HEAT		
VOLUME GAL.	7500	TREATMENT – 1100° F.		

DATA NOT SHOWN ARE NOT FACTOR OF DESIGN

MATERIAL					
SHELL	MAT'L	C.S.	HEAD	MAT'L	C.S.
	THK.	0.25"		TYPE	
				THK.	0.25"
FLANGE			SKIRT		
NOZZLE NECK			BASE		
BOLTING			ANCH. BOLT		
COUPLING			SADDLES		
WELD FTG.					
GASKETS					
SHELL DIA.	8.0'		SHELL LENGTH	22.0'	

PAINT

INSULATION

LOCATION

VESSELS REQUIRED	APPROX. FULL OPERATING WT. LBS

Rev. No.	Description	Appr. By	Drawn By	Date

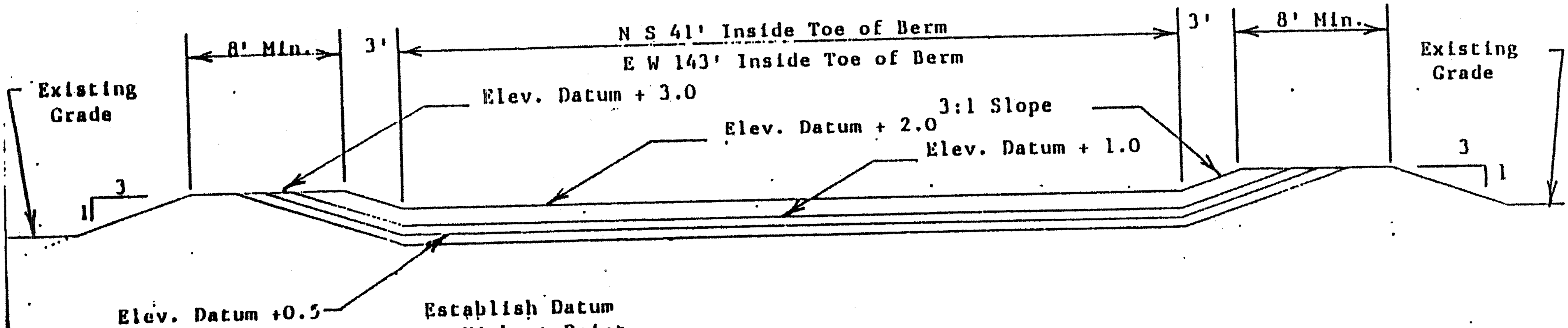
REVISIONS

STORAGE TANK D
for
P C B PROCESSING SYSTEM

Drawn By	MOM	Project No.	050022
Appr. By	PTJ	Revision No.	000000
Date	6-1-87	Drawing No.	NV 870002
Scale	NONE	Sheet 6 of	6

APPENDIX H

PCB TANK FARM LINER SYSTEM



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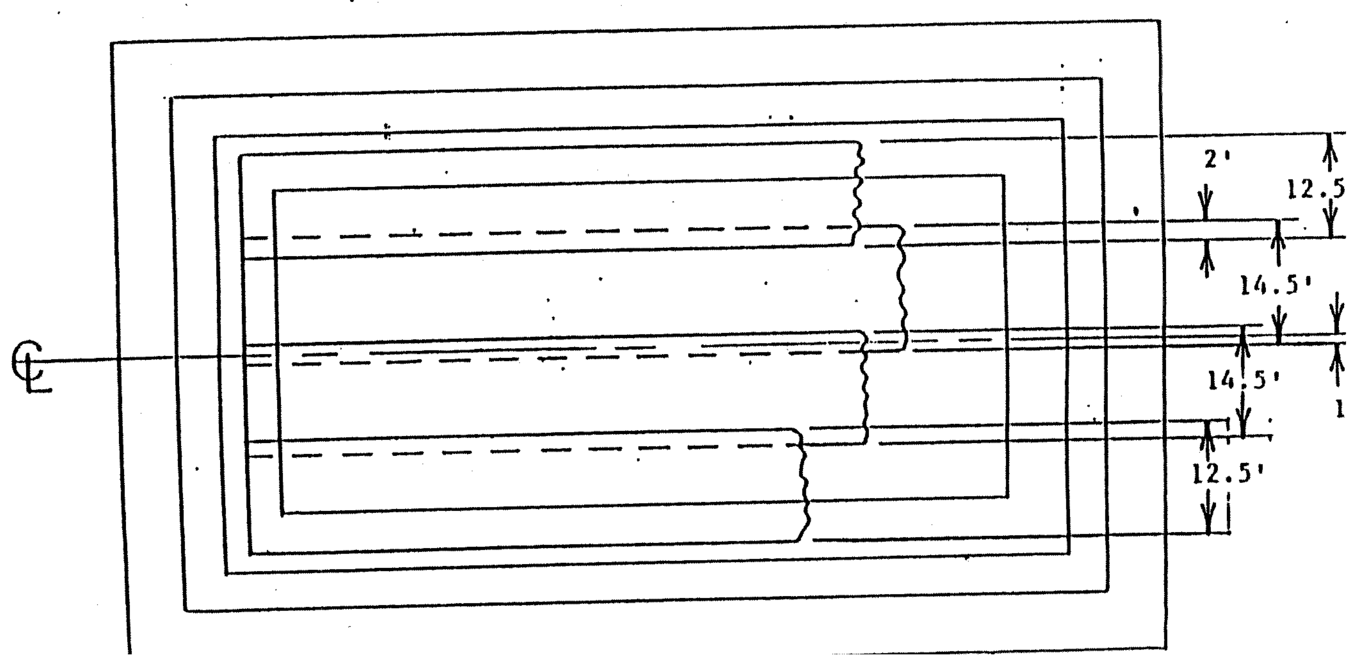


No.	Description	By	Approv
REVISIONS			

HAZARDOUS WASTE MANAGEMENT FACIL
Beatty, Nevada
PCB Pad

Drawn By: M. M.

Checked By:

Date: 3/23/84

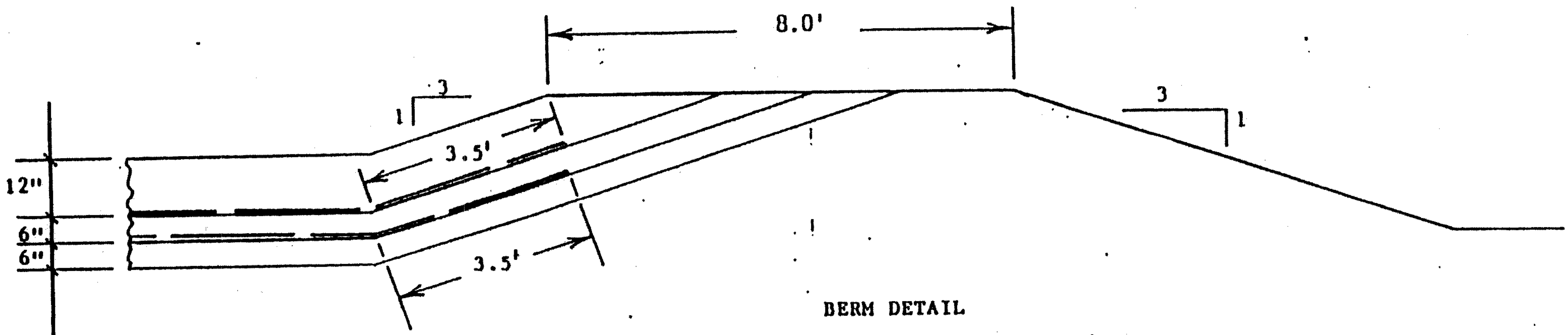
Scale: Noted

Sheet 2 of 3

USEcolo

US Ecology, In
9200 Shelbyvil
Suite 319
Louisville, KY

Drawing No. NV8403



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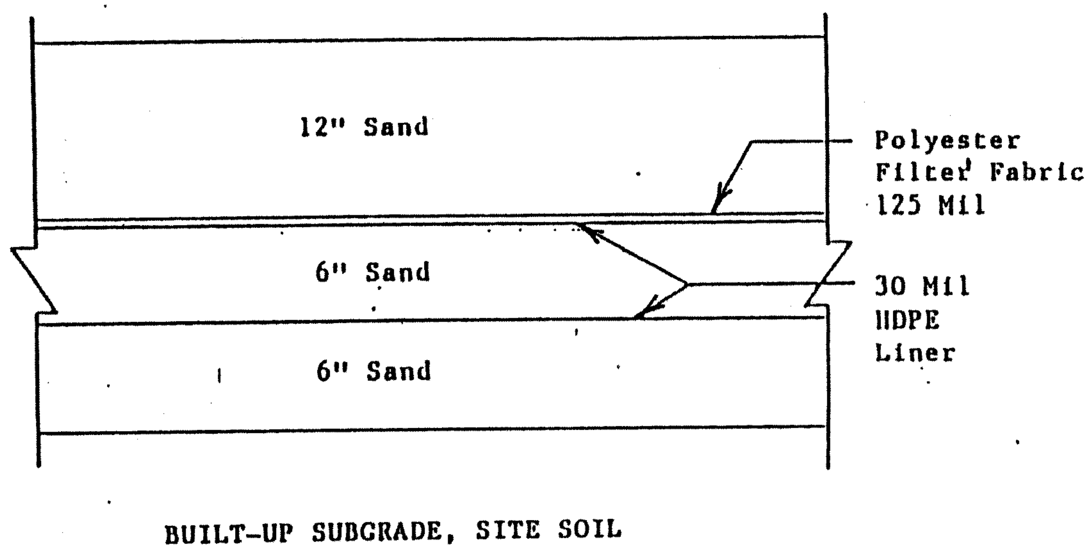


No Scale

No.	Description	By	Approval

REVISIONS

HAZARDOUS WASTE MANAGEMENT FACILI
Beatty, Nevada
PCB Pad

Drawn By: M. M.

Checked By:

Date: 3/12/84

Scale: Noted

Sheet 3 of 3

USEcolog

US Ecology, Inc.
9200 Shelbyville
Suite 319
Louisville, KY

Drawing No. NV8403-

APPENDIX I

PCB TANK FARM SECONDARY CONTAINMENT CALCULATIONS

Secondary Containment Calculations

PCB Tank Farm

Tank Volumes:

T-4 = 7,500 gallons
T-5 = 7,500 gallons
T-6 = 5,000 gallons
T-7 = 5,000 gallons
T-8 = 3,000 gallons
Total = 28,000 gallons

Precipitation from 100 year storm = 3 inches

Precipitation Volume = 0.25 ft x 48ft x 48ft x 7.48gal/ft^3 = *4,308 gallons*

Requirement:

Containment Capacity Required = Twice the Volume of largest tank + Precipitation
= 7,500(2) + 4,308 = 19,308 gallons

Containment Capacity Available = (a) volume of air + (b) volume in sand

(a) = 48ft x 48ft x 1.5ft x 7.48gal/ft^3 = 25,850 gallons

(b) = 48ft x 48ft x 0.0833ft x 30% (porosity of sand) x 7.48gal/ft^3 = 430 gallons (This assumes 1 inch of soil in containment area)

Tank Farm Containment = $\boxed{\textit{26,280 gallons}}$

PCB Storage Area

PCB storage area capacity = 71,816 gallons

Requirement:

25% of the total capacity *or* twice the volume of the largest container. Whichever is greater. (Precipitation is not taken into consideration since the building in enclosed)

25% of the total capacity = 71,816 gallons x 0.25 = *17,954 gallons*

or

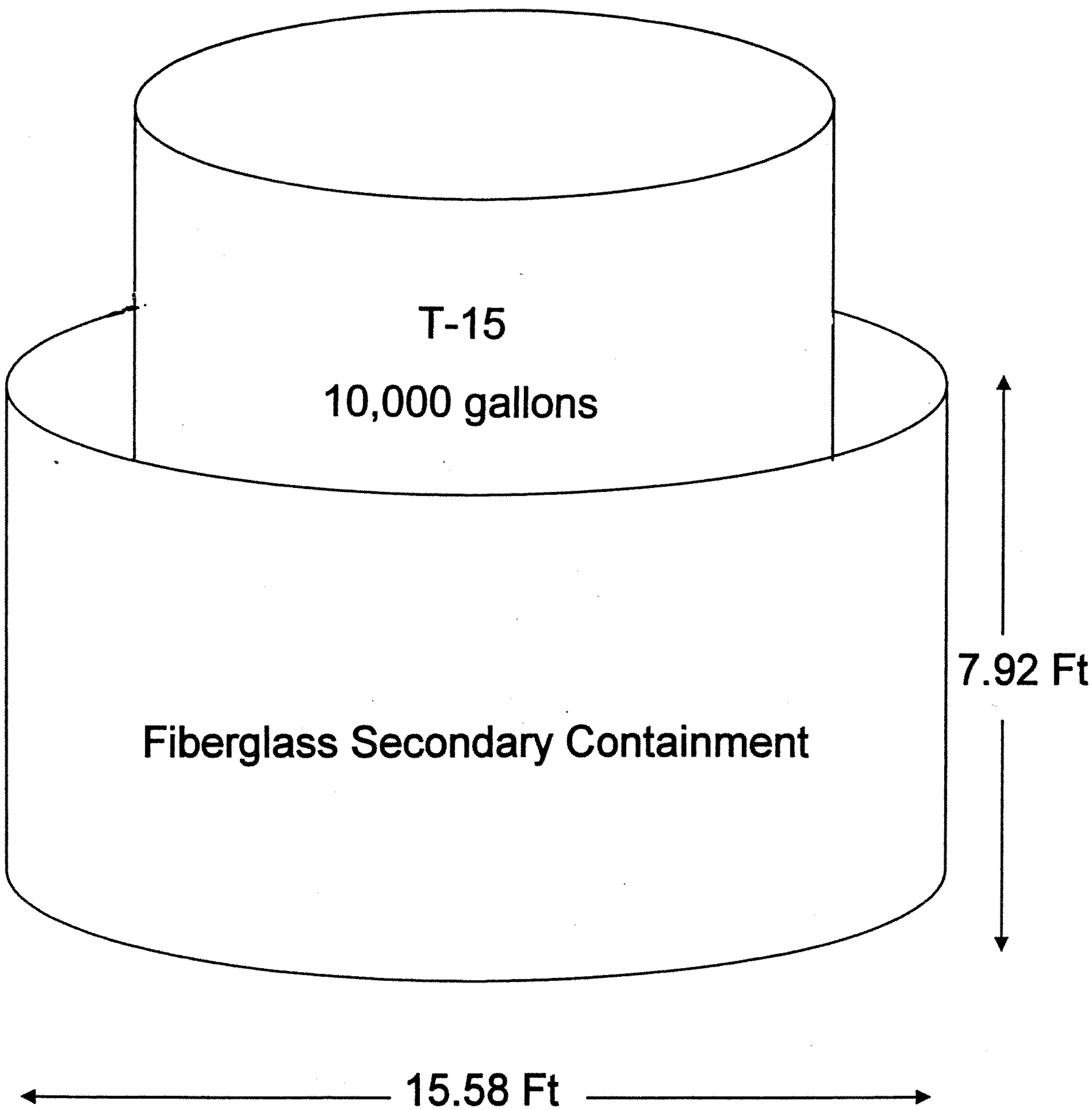
Vol of largest container = 115 gallons

Containment Capacity Available = 48ft x 100ft x 0.5ft x 7.48gal/ft^3 = $\boxed{\textit{17,954 gallons}}$

APPENDIX J

LEACHATE STORAGE TANK DIAGRAM AND PICTURE

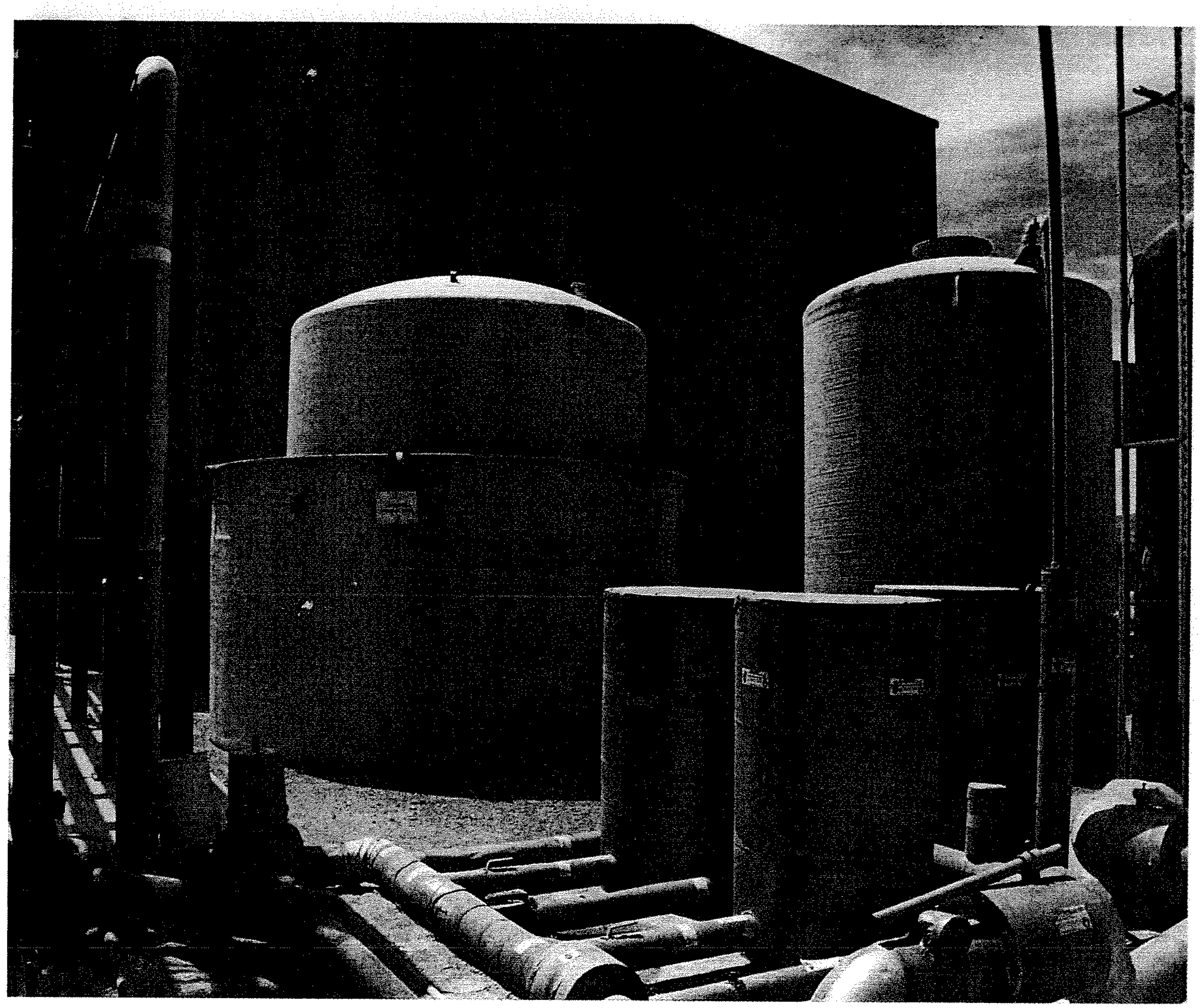
T-15 Leachate Storage



US Ecology Nevada

March 2010

T-15 Leachate Storage Tank



APPENDIX K

LEACHATE STORAGE TANK INTEGRITY ASSESSMENT

ENGINEERING CERTIFICATION

LEACHATE STORAGE TANK

U.S. ECOLOGY, INC.
BEATTY, NEVADA

April 1995

Revision 0

PROFESSIONAL ENGINEER STATE OF NEVADA
GRANT A. JACKSON
CIVIL
No. 10299

04-18-1995

Prepared By

NAISMITH ENGINEERING, INC.
ENGINEERING • ENVIRONMENTAL • SURVEYING
CORPUS CHRISTI, TEXAS

NEI PROJECT NO. 4383

ENGINEERING CERTIFICATION
LEACHATE STORAGE TANK
U.S. ECOLOGY, INC.
BEATTY, NEVADA

TABLE OF CONTENTS

ENGINEERING CERTIFICATION
LEACHATE STORAGE TANK
U.S. ECOLOGY, INC.
BEATTY, NEVADA

1. GENERAL:

1..1. **Introduction:** Naismith Engineering, Inc., (NEI) was retained by U.S. Ecology, Inc., (USE) to provide an integrity assessment for the Leachate Storage Tank located at the U.S. Ecology, Inc., facility near Beatty, Nevada. Facility operations are governed by two (2) separate authorizations. The facility is authorized to manage hazardous wastes regulated by the Resource Conservation and Recovery Act (RCRA) under a permit (Permit No. NEV-HW002) issued by the Nevada Department of Conservation and Natural Resources, Division of Environmental Protection (NDEP). The facility is also authorized to manage toxic substances regulated by the Toxic Substances Control Act (TSCA) under an approval issued by the U.S. Environmental Protection Agency, (EPA) Region IX. This assessment conforms with the requirements of the EPA as outlined in Title 40, Code of Federal Regulations (CFR), Part 264, Subpart J, "Tank Systems".

1..2. **Facility Description:** The hazardous waste storage tank being assessed is a ten thousand (10,000) gallon aboveground fiber reinforced plastic (FRP) tank. The tank will be used to store leachate gathered from the hazardous waste landfill at the facility. The tank is installed inside a FRP secondary containment tank unit. The tank system is supported on a reinforced concrete foundation. The location of the storage tank within the facility is illustrated on the location map in Appendix A.

1..2..1. **Storage Tank:** The Leachate Storage Tank has a diameter of approximately twelve (12) feet and a shell height of approximately twelve (12) feet. An adequate number of fittings are installed on the tank to allow it to be properly operated and monitored. The tank is furnished with one (1) twenty-two (22) inch diameter manhole on the roof. Design information for the tank is included in Appendix B.

In order to prevent accidental overfill, the Leachate Storage Tank is furnished with a high level sensor connected to a visible alarm located adjacent to the tank fill connection. The alarm is set to turn on when liquid in the tank reaches a level of eleven (11) feet (approximately ninety two percent [92%] of its maximum volume). The level in the tank is also measured using a portable liquid level indicator prior to placing any material into the tank. The liquid level in the tank is monitored by plant personnel during the filling operation.

The controlling specification for the fabrication of this tank is ASTM D3299 for filament wound FRP tanks.

1..2..2. **Secondary Containment:** The storage tank is located within a circular secondary containment open-top tank approximately sixteen (16) feet in diameter and eight (8) feet in height. The FRP secondary containment unit was movement anticipated during earthquake conditions. The tank was designed and constructed with adequate bracing and anchoring to withstand the expected seismic loads. The tank and support structure were designed using a liquid waste specific gravity of 1.0. Structural calculations are included in Appendix D.

2..3. **Compatibility With Wastes:** The Leachate Storage Tank could potentially be exposed to any of the waste streams which the facility is permitted to handle. However, these compounds will not be in concentrated form. Tests previously performed on the leachate from the landfill collection system indicate that it has a pH of approximately 6.1 to 6.8. This indicates that the material will not be reactive. Additional data on the leachate indicates that the conductivity ranges from 74,000 to 110,600 micromhos per centimeter (μmho/cm). The corrosion resistant properties of FRP ensure that substances with a pH near 7 will not effect the integrity of the system. In addition, liquids having a conductivity of greater than 75,000 μmho/cm, will not affect these materials. Based on the chemical resistance properties of FRP and the dilute nature of the wastes potentially present, the materials from which the tank and secondary containment were constructed are appropriate for use with the liquid to be stored in the tank. As an additional measure of protection against the failure of the tanks due to incompatibility with the wastes, the tanks will be inspected routinely, and repaired if necessary, as outlined below.

2..4. **Corrosion Protection:** Both the primary containment tank and the secondary containment tank were constructed entirely from corrosion resistant materials. In addition, the tank will be inspected prior to being placed into service, or prior to a change in service, to ensure that it does not fail due to corrosion. To prevent damage caused by incompatible wastes, the tank will be decommissioned and cleaned prior to a change in service. Any problems detected will be corrected prior to placing the tank into service.

2..5. **Inspection/Testing:** The storage tank and the associated containment system have been inspected or tested as required to demonstrate compliance with 40 CFR Part 264, Subpart J. The tank was successfully hydrotested on March 24, 1995. A data sheet for this test has been included in Appendix B.

ENGINEERING CERTIFICATION
LEACHATE STORAGE TANK
U.S. ECOLOGY, INC.
BEATTY, NEVADA

3. **CERTIFICATION:** This constitutes certification of the proper design and construction of the Leachate Storage Tank at the U.S. Ecology facility in Beatty, Nevada, in compliance with the requirements of 40 CFR Part 264, Subpart J.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAISMITH ENGINEERING, INC.

Grant A. Jackson, P.E.

PROFESSIONAL ENGINEER - STATE OF NEVADA
GRANT A. JACKSON
CIVIL
No. 10299

04-18-1995

REFERENCES

1. ACI 340.4R-91 (1991), Design Handbook - Volume 1, Beams, One-Way Slabs, Brackets, Footings, and Pile Caps, American Concrete Institute Publication SP-17(91).

2. ACI 318-89 and ACI 318R-89 (revised 1992), Building Code Requirements for Reinforced Concrete and Commentary, American Concrete Institute Publications.

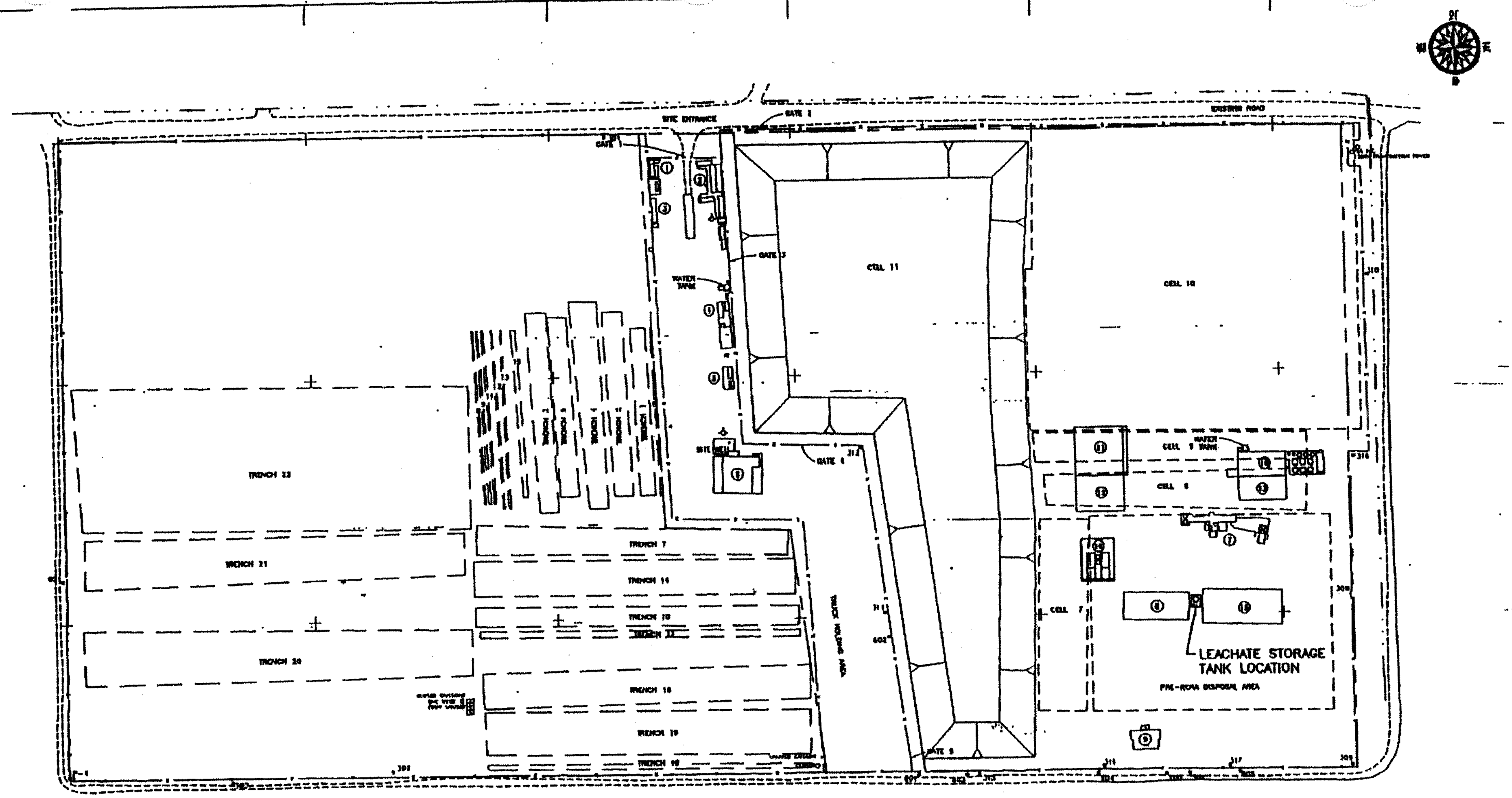
3. "Investigation of the Geotechnical Conditions for Planned Containment Building, Stabilization Building, and Tank Farm", Grant Environmental, Englewood, Colorado, June 15, 1994.

4. Perry, Robert H., and Chilton, Cecil H. (1973), Chemical Engineers' Handbook, 5th Edition, McGraw-Hill Book Company, New York.

5. Rainfall Frequency Atlas of the United States, U.S. Department of Commerce Weather Bureau, May 1961.

6. Ringo, B. C., and Anderson, R. B. (1992), Designing Floor Slabs on Grade, The Aberdeen Group, Addison, Illinois.

APPENDIX A
Site Location Map



LEGEND

- UNITS OF COMPLETED TRENCH
- DRAINAGE DITCH AND DIRECTION OF FLOW
- PERMIT LINE
- UNIMPROVED ROAD
- FENCE LINE
- SITE COORDINATE SYSTEM MARKER LOCATION IN NORTHING AND EASTING
- MONITOR WELL LOCATION AND NUMBER
- HYDRANT

KEY

1. STATE TRAILER
2. ADMINISTRATION OFFICES
3. SECURITY AND DRIVERS TRAILER
4. LABORATORY AND LAB STORAGE
5. FUEL STORAGE
6. MAINTENANCE SHOP
7. WASTE STABILIZATION SYSTEM
8. TRUCK PARKING
9. EVAPORATION TANK
10. PCB PROCESSING AREA
11. BULK STABILIZATION/CONTAINMENT BLDG.
12. RCRA STORAGE AREA C & 2
13. RCRA STORAGE AREA C & 1
14. LIQUID BULKING\STORAGE TANK FARM
15. FUTURE DEVELOPMENT C & 3
16. STABILIZATION TANKS

SCALE 100 50 0 100 FEET

Rev	Drawn	Chkd	Appr	Date	Description
1	DRK			7/01	GENERAL REVISIONS

REVISIONS

US Ecology
an American Ecology company
US Ecology Inc.
5333 WESTHEIMER
Suite 1000
Houston, Texas 77056

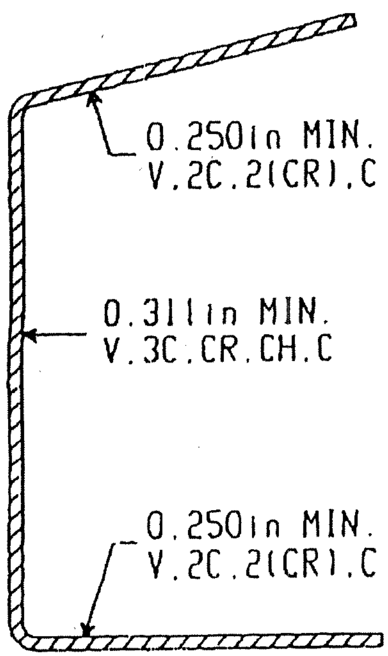
Drawn By: DRK
Checked By: ERP
Appr. By:
Date: 11/03
Scale: AS NOTED
Project No.: NV-148

Reference Drawings: NEI-4383-FLP

FACILITY LOCATION PLAN
HAZARDOUS WASTE MANAGEMENT FACILITY
U.S. Ecology, Inc.
BEATTY, NEVADA

Drawing No.: NV-148-FIG-003
Revision: 1

APPENDIX B
Storage Tank Data



STRUCTURE

DESIGN CONDITIONS

SERVICE: VASTE VATER	**TEMP:** AMB.
PRESSURE: ATMOSPHERIC+STATIC HEAD	
CAPACITY: 10000gal NOM **SPEC GRAV:** 1.0	**CONC:**
DIAMETER: 12ft ID **HEIGHT:** 12ft SS	
BOTTOM: FLAT	**TOP:** DISHED
LINER: ISOPHTHALIC w/ C-VEIL	
STRUCTURE: ISOPHTHALIC w/ E-GLASS	
SURFACE: NOVATANK GREY GELCOAT	
STANDARD: ASTM D3299	
GASKETS: NEOPRENE	
BOLTS: ZINC PLATED STEEL	
QUANTITY: (1)	

SCHEDULE OF FITTINGS

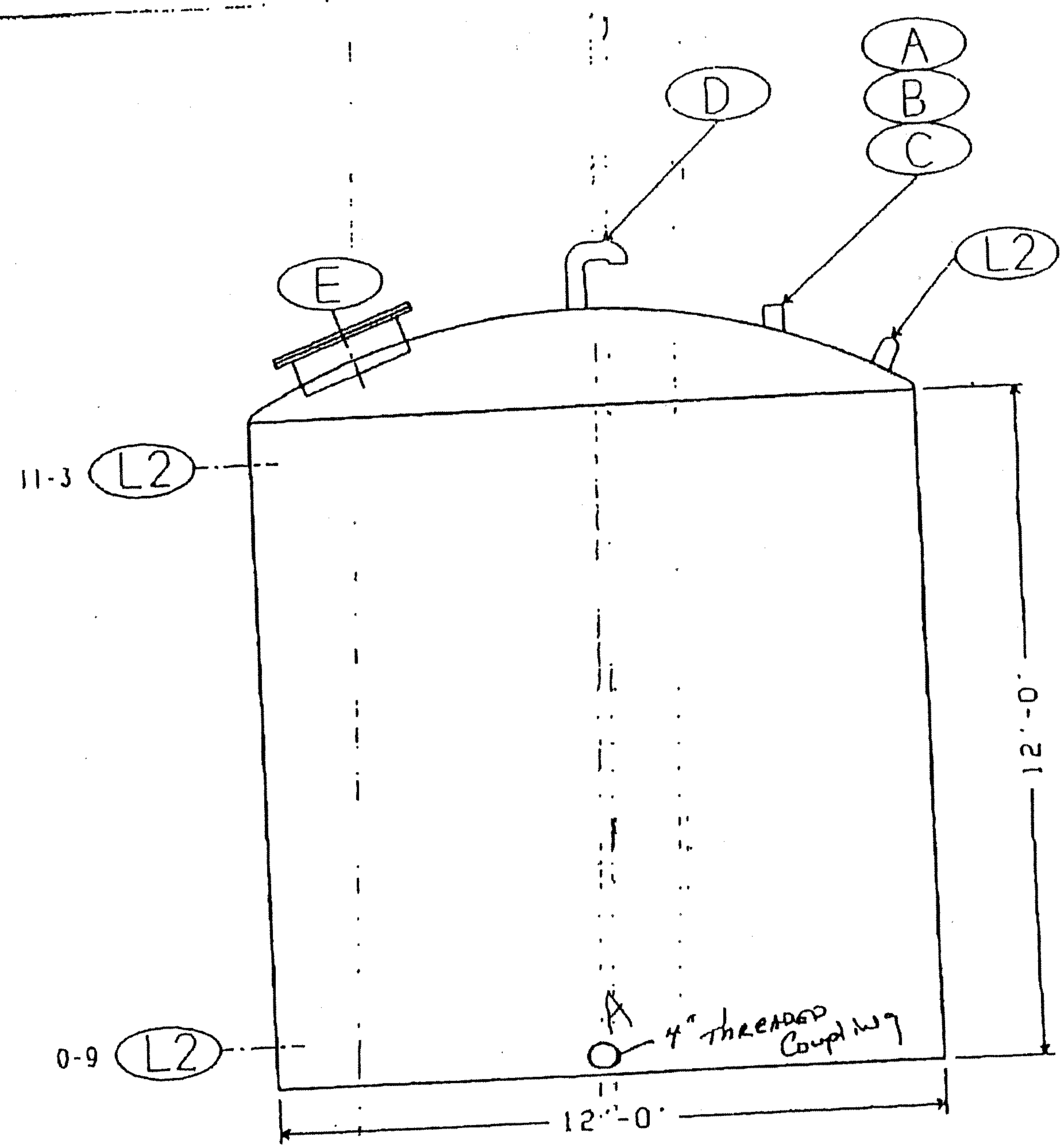
SYM	DESCRIPTION	SIZE			
A	THC:	2	4		
B	FTC:	3			
C	THC:	3			
D	VGN:	2	4		
E	BMV:	22			

KEY TO FITTINGS:
BMV = BOLTED MANWAY
FTC = FULL THREADED COUPLING
THC = THREADED HALF-COUPLING
VGN = GOOSENECK VENT

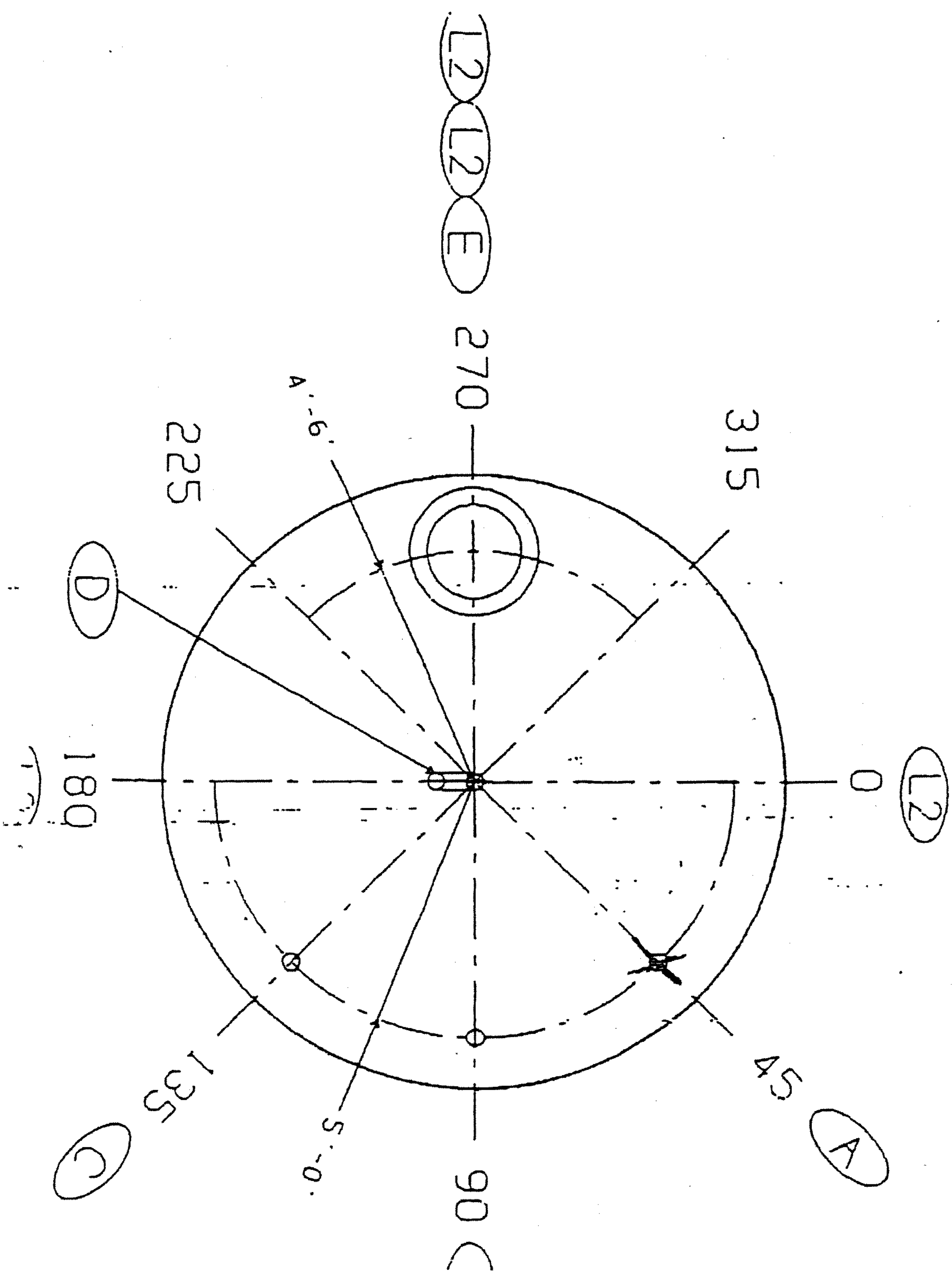
ACCESSORIES

SYM	QTY	DESCRIPTION	MATERIAL
L2	4	LIFT EYE; TYPE 2	CARBON STEEL

(1) C = CHOP 27% E-GLASS REINFORCEMENT 0.043
H = HOOP VOUND 50% E-GLASS REINFORCEMENT 0.023
M = 1.5oz RANDOM STRAND MAT 0.043
R = 24oz VOVEN ROVING 0.033
V = C-VEIL 0.010



A
B
C
D
E
L2
L2
L2
11-3
0-9
A
4" THREADED Coupling
12'-0"
12'-0"


L2
L2
E
270
315
225
D
180
0
L2
45
A
135
C
90
4'-6"
5'-0"

NAISMITH ENGINEERING, INC.
PROJECT INSPECTION REPORT

Project Title: Leachate Tank Certification	
Owner: U.S. Ecology, Inc. Beatty, NV (American Ecology)	
Owner's Project No.: NV-	NEI Project No.: 4383

Date: March 24, 1995	Time: 0915 to 1800 (PST)	Page 1 of 2
Contractor: N/A	Type of inspection: ☐ daily ☒ periodic	
Inspector(s): GAJ	Persons contacted on-site: Dave Tolbert, Doug Griffen, Bill Marland	
Weather: Cold (45°F), windy + overcast	Testing in progress: Visual inspection, hydrostatic test	
Contractor: ☐ working ☐ delayed (weather) ☐ delayed due to N/A		

Work in progress: Installation of high level alarm by site personnel.

Work completed since last inspection: N/A

Equipment/materials received on-site since last inspection: N/A
High level alarm

Summary:
0915 - Arrived at site
1030 - Initiated Installation of high level alarm.
1100 - Began filling with water
1600 - Made initial measurements (Primary tank - 3.10") (Secondary tank - 8.60")
(See attached sheet for summary of notes made during inspection)

(Attach additional sheets as required)

Signature of inspector(s): Grant A. Jackson

Distribution: Steve Del'Homme - American Ecology, Dave Tolbert - U.S. Ecology

E:\PROJMAN\INSP.FRM REVISED 08-30-94

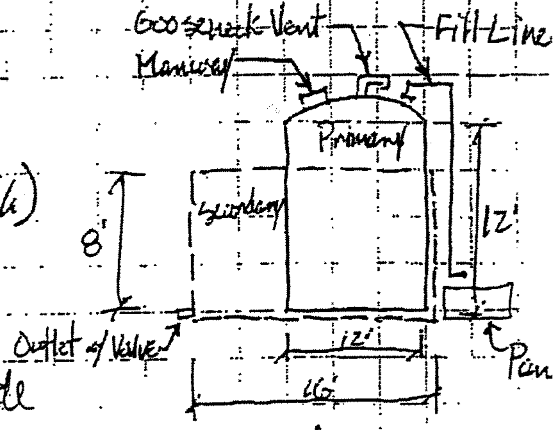
JOB NO. 4383 | NAISMITH NEI ENGINEERING, INC. | 2

DESCRIPTION Notes - Site Inspection - Leachate Tank
USE - NV

DATE 03-24-1995
BY GAJ

Tank: 10,000 gallon FRP (12'Ø x 12'h)

Secondary Containment: FRP Open-top tank (16'Ø x 8'h) on conc. slab (See sketch) →



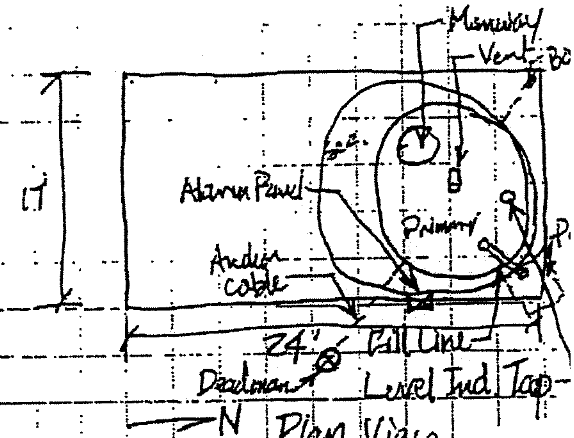
Section

High level alarm to be located on panel - outside of sec. containment, near fill line.
Electrical - level probes - red floodlight.

Level in tank? Measured using Solinst meter. } Check w/ Doug Gretten

Tanks anchored to slab and deadman

Sec. containment pan 4'x4'x1' deep placed under fill line



Plan View

Attach to insp. report.

NAISMITH ENGINEERING, INC.
PROJECT INSPECTION REPORT

Project Title: Leachate Tank Certification	
Owner: U.S. Ecology, Inc., Beatty, NV (American Ecology)	
Owner's Project No.:	NEI Project No.: 4383

Date: 03-25-1995	Time: 0830-1000 PST	Page 1 of 1
Contractor: N/A	Type of inspection: ☐ daily ☒ periodic	
Inspector(s): GAJ	Persons contacted on-site: security guard	
Weather: Cold (45°) windy & clear	Testing in progress: hydrostatic & alarm	
Contractor: ☐ working ☐ delayed (weather) ☐ delayed due to N/A		

Work in progress: None

Work completed since last inspection: Installation of High level alarm

Equipment/materials received on-site since last inspection: None

Summary:
Visual observations: no visible leaks; no bubbles, etc.
Liquid level measurements (0930): Primary 3.10'
Secondary 8.60"
High level alarm checked: ok

(Attach additional sheets as required)

Signature of inspector(s): Grant A. Jackson

Distribution: Steve Del Homme - American Ecology, Dave Tolbert - U.S. Ecology

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REVISED 08-30-94

ENGINEERING CERTIFICATION
LEACHATE STORAGE TANK
U.S. ECOLOGY, INC.
BEATTY, NEVADA

APPENDIX C
Containment System Volume Calculations

Revision 0 April 18, 1995

JOB NO. 4383 | NAISMITH ENGINEERING, INC. | SHEET NO. 1
DESCRIPTION: LEACHATE STORAGE TANK | DATE: 03-23-1995

SECONDARY CONTAINMENT VOLUME CALCULATIONS

OBJECTIVE: Part 1. Compute the required height for the secondary containment walls for the Leachate Storage Tank.

Part 2. Compute the required height for the secondary containment walls for the pan under the piping.

PART 1

APPROACH: Determine the required volume of containment according to 40 CFR §264.193, which requires that the secondary containment be able to contain one hundred percent (100%) of the capacity of the largest tank within its boundary, plus the precipitation resulting from a 25-year, 24-hour rainfall event.

ASSUMPTIONS:

1. The storage tank has a nominal storage capacity of 10,000 gallons.
2. The secondary containment is a circular open-top tank, sixteen (16) feet in diameter and eight (8) feet in height.
3. The secondary containment unit is sized to also hold a 100-year, 24-hour rainfall event. In the vicinity of Beatty, Nevada, a 100-year, 24-hour rainfall event produces 2.60 inches of rain water.
4. Since the secondary containment unit only contains one tank, a leak in this tank will equalize levels inside the tank and the secondary containment unit. Therefore, no containment volume will be lost to the tank. Calculations will be based on the gross area of the secondary containment unit.

CALCULATIONS:

Step 1 Calculate the area of the secondary containment unit, A.

$$A = \pi \times r^2 = 3.14159 \times (8)^2 = 201.1 \text{ ft}^2$$

This is equivalent to 201.1 ft^3 per foot of height

Step 2 Calculate the volume of liquid to be contained, V.

$$V = 10{,}000 \text{ gal}/(7.48 \text{ gal/ft}^3) = 1{,}336.9 \text{ ft}^3$$

Step 3 Calculate the required containment wall height, h, based on tank volume (V) alone.

$$h = V/A = 1{,}336.9 \text{ ft}^3/201.1 \text{ ft}^2 = \underline{6.65 \text{ ft}}$$

Step 4 Calculate the total required containment wall height, h_t, based on V_{PCB} and a 100-year rainfall event.

$$h_t = 6.65 \text{ ft} + 2.6 \text{ in}/(12 \text{ in/ft}) = \underline{6.86 \text{ ft}}$$

⟹ Using 8.0 feet provides 1.1 feet of freeboard indicating that this design is adequate.

PART 2

APPROACH: Determine the required volume of containment according to 40 CFR §264.193. This will include the volume of the piping, plus the precipitation resulting from a 25-year, 24-hour rainfall event.

ASSUMPTIONS:

1. The fill piping has a diameter of two (2) inches.
2. The fill piping is approximately seventeen (17) feet in length.
3. The dimensions of the secondary containment pan are four (4) feet by four (4) feet by one (1) foot high.
4. An air-gap is provided between the tank fill entrance and the highest level in the tank. This will prevent siphoning the contents of the tank back into the pan.
5. The secondary containment pan is sized to also hold a 100-year, 24-hour rainfall event (2.60 inches).

CALCULATIONS:

Step 1 Calculate the volume of liquid contained in the piping, V.

$$V = \pi \times r^2 = 3.14159 \times (2/12)^2 \times 17 = 0.37 \text{ ft}^3$$

Step 2 Calculate the wall height required.

$h = 0.37\ ft^3 / (4 \times 4)\ ft^2 = 0.023\ ft \times 12\ in/ft = 0.28\ in.$

With a precipitation allowance of 2.6 inches, this gives a total height of:

$h = 2.60\ in + 0.28\ in = 2.88\ in.$

══> Using 12 inches provides 9.12 inches of freeboard indicating that this design is adequate.

ENGINEERING CERTIFICATION
LEACHATE STORAGE TANK
U.S. ECOLOGY, INC.
BEATTY, NEVADA

APPENDIX D
Structural Calculations

Revision 0

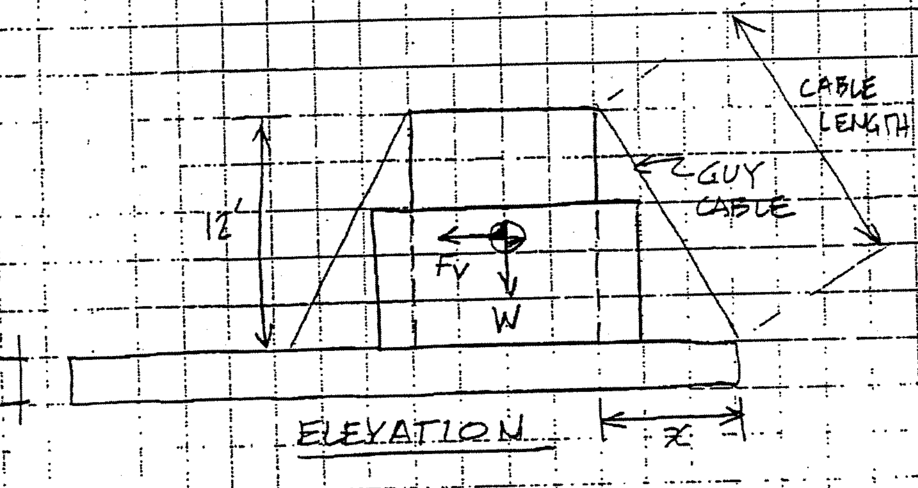
April 18, 1995

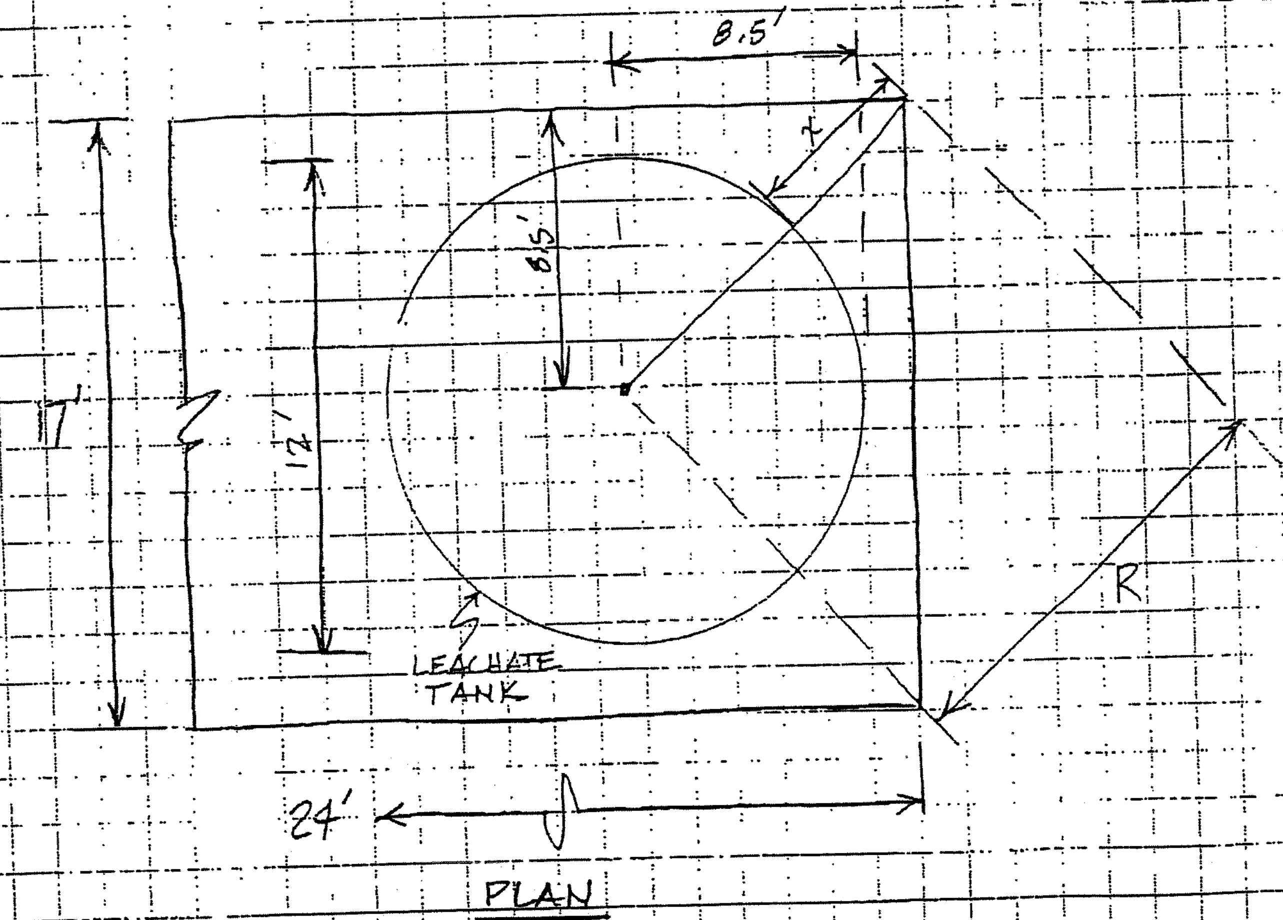
DATE 3/31/95

DESCRIPTION AM. ECO, FDN.

BY BAB

DRAWING NOT TO SCALE





NAISMITH ENGINEERING, INC.
CALCULATIONS - LEACHATE STORAGE TANK
REINFORCED CONCRETE SLAB-ON-GRADE

OBJECTIVE: To perform a check of the structural adequacy of an existing slab-on-grade.

Approach:
1. Establish soil pressure limits.
2. Perform analysis of slab based on established engineering standards and the 1991 Uniform Building Code.
3. Consider all loading conditions to which slab may be subjected.

GIVEN:
1. The site is located at the edge of Zone 3 seismic loading.
2. Previous soils report by Grant Environmental recommended soil pressures not to exceed 5 tsf.
3. Plan dimensions of slab, thickness of slab and reinforcing steel within the slab.
4. GUY WIRES (4) PROVIDED TO CREATE DAMPING EFFECT FROM SEISMIC LOADING

CALCULATIONS:
step No. 1 Check overturning moments to determine adequacy of slab thickness and size.

$W = W_{TANK} + W_{LIQUID}$

W_{TANK} (includes primary containment tank) = 4500 lb

W_{LIQUID} (tank full) = 84,700 lbs.

W = 4500 + 84700 = 89,200 lb.

SEISMIC FORCES GOVERN OVERTURNING. BASED ON UBC 91 CRITERIA, APPROXIMATELY 10% OF THE WEIGHT (W) IS APPLIED TO THE BASE OF THE TANK(S) AND IS ASSUMED TO ACT THROUGH THE CENTER OF GRAVITY (C.G.) OF THE TANK CONTAINING LIQUIDS.

F_V (SEISMIC SHEAR FORCE) = 0.10(89,200) = 8920 lb.

M (OVERTURNING MOMENT) = (8920 lb)(6.0 FT.)

M = 53,520 lb-FT. (53.5 kip-feet)

M_r (resisting moment) = [(17' x 24' x t) 0.150 k/cu. FT] 17'/2

SET M_R (resisting moment) = M (overturning moment) x F.S.

520t = 53.5 (1.4)

t = 0.14 feet < 0.33 feet O.K.

Step No. 2 Check of soil bearing pressure.

- TYPICAL LOADING

Since tank is not resting on the center of the slab, assume majority of loading is carried on on slab area = (17')(16') = 272 SQ. FT

SOIL Bearing (SB) = (89,200 lb. + slab weight)/272

SB = [89200 + (24')(17')(0.33') 150]/272

SB = 402 psf << 5 TSF

• SEISMIC LOADING (FOR PURPOSES OF SOIL BEARING PRESSURE, THE DAMPING EFFECTS OF THE GUY WIRES (CABLES) WILL BE CONSERVATIVELY NEGLECTED.

SOIL BEARING = $W/A \pm MY/I$

: Y = Distance from edge of slab to center of slab

$Y = 8.5$ feet

. I = Moment of inertia of slab foot print

$I = bh^2/12 = (16')(17')^2/12 = 385\ ft^4$

SOIL BEARING (SB) = $402 \pm 53{,}520(8.5')/385 =$

$SB = 402 + 1182 = 1584\ psf < 2000\ psf$ O.K.

step No. 3 Check sliding

ϕ (Provided) $= 28° \leq \tan^{-1}(F_V/W)$

ϕ (actual) $= \tan^{-1}(8920/89200) = 5.7° \ll 28°$ O.K

step No. 4 PUNCHING SHEAR

O.K. BY inspection

step No. 5 Reinforcing

The maximum moment is induced in the slab as a result of the seismic forces and is therefore equivalent to the overturning moment.

DESCRIPTION Am. Eco. Fdn.

DATE 3/31/95

BY BAB

$A_s = M / j \cdot f_s \cdot d$

$\cdot M = 53.5$ kip-feet / 17' = 3.1 kip-feet / ft. slab width

$\cdot j = 1 - k/3 = 1 - 0.38/3 = 0.87$

$k = f_c / (f_c + f_s/n) = 2000/(2000 + 31900/10) = 0.38$

$f_c' = 0.4(5000\ psi) = 2000\ psi$ (ACI)

f_s (Allowable steel stress may be increased by 33% pursuant to building code)

$f_s = (1.33)\ 24\ ksi = 31.9\ ksi$

$n = 10$

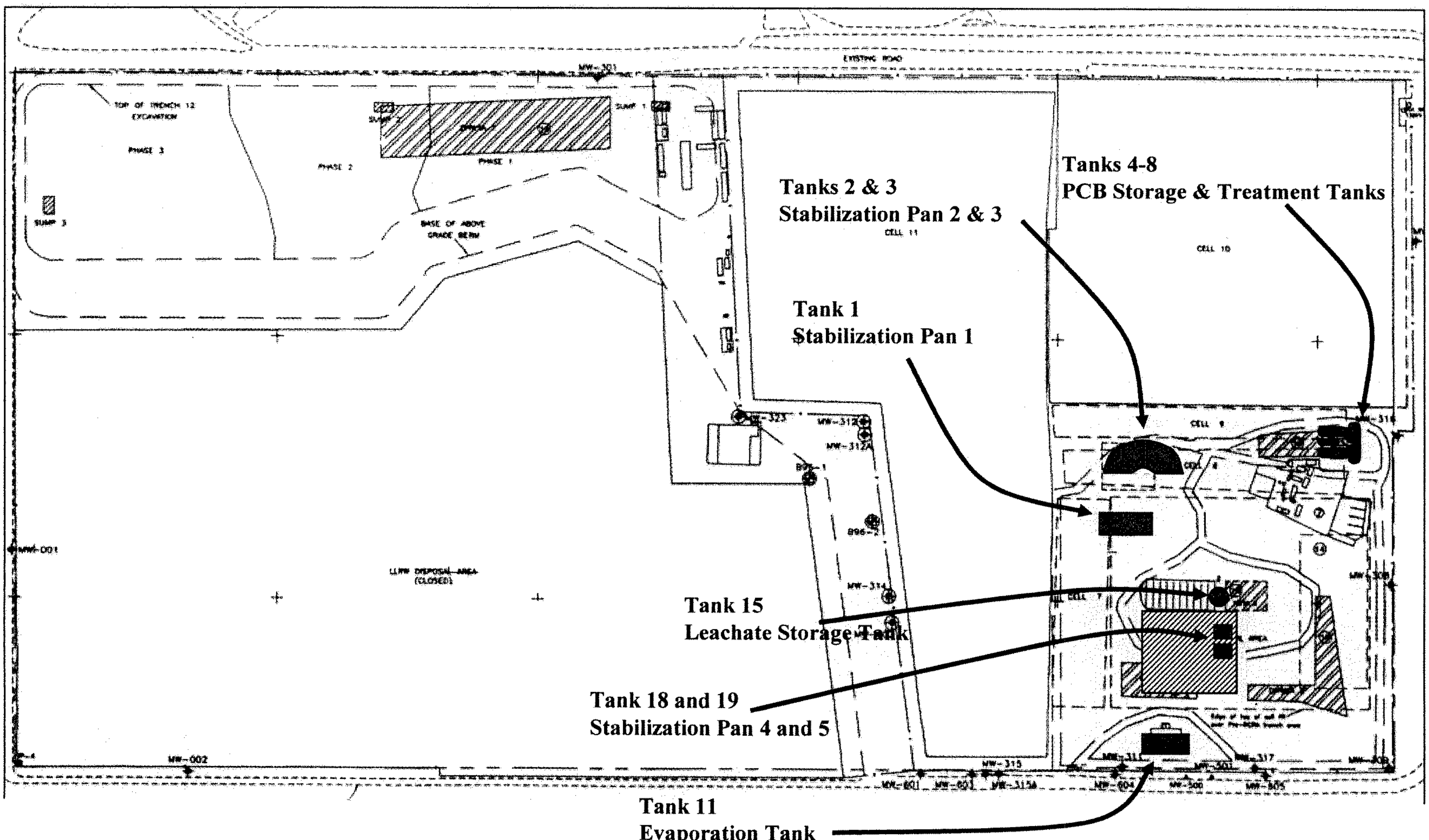
$A_{s_{REQ}} = (3.1)(12) / 0.87 \times (1.33 \times 24) \times 2'' = 0.67\ in^2/FT$

The steel provided for the slab is $0.27\ in^2/FT$. Working backwards through the calculations yields an allowable force (F_v) of 3541 lb. (Horizontal component of 8920 lb - 3541 lb = 5379 lb.) The total force to be resisted by each cable is approximately 12000 lb.

APPENDIX L
TANK SYSTEMS LOCATION DIAGRAM

Tank Systems Location Diagram

US Ecology Nevada, Inc.



Tank Systems Report
Revised 4/21/10

APPENDIX M

CONTAINER MANAGEMENT BUILDING

TANK SYSTEMS 18 AND 19
(STABILIZATION PANS 4 AND 5)

INSTALLATION CERTIFICATION REPORT

Stabilization Facility - Mixing Tanks
Beatty, Nevada

Project No. 06B-G1263.1

Prepared for

US Ecology Nevada

May 4, 2007

AMERICAN GEO TECHNICS

AMERICAN GEO TECHNICS

Prepared for

US Ecology Nevada
PO Box 578
Beatty, NV 89003

Attention: Bob Marchand, Facilities Manager

INSTALLATION CERTIFICATION REPORT
Stabilization Facility - Mixing Tanks
Beatty, Nevada

American Geotechnics
Project No. 06B-G1263.1

Prepared by

American Geotechnics

Exp 6-30-10

PROFESSIONAL ENGINEER - STATE OF NEVADA
VAUGHN J. THURGOOD
5/4/07
CIVIL
No. 18380

Vaughn Thurgood
Vaughn Thurgood, PE
CQA Manager

Rex W. Hansen
Rex W. Hansen, PE Idaho
Principal Engineer

AMERICAN GEO TECHNICS

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Purpose and Scope of Work

American Geotechnics was retained to provide construction quality assurance (CQA) services during the erection of the Stabilization Facility at the US Ecology Nevada (USEN) site. This report has been prepared for the purpose of certifying the installation of two mixing tanks in conformance with Title 40 CFR Part 264 Subpart J. The tanks were constructed as part of a new stabilization facility. The site is located in Nye County approximately 11 miles south of Beatty, Nevada along Highway 95.

1.2 Description of Operations

The subject tanks will serve as mixing pans, used to facilitate the solidification or stabilization of waste materials. Waste materials will typically be transferred into the mixing tanks from either end-dump trucks or tankers. The waste materials may consist of liquid, sludge, or solid waste debris with hazardous characteristics. Waste stabilization will be accomplished by mixing hazardous waste materials with reagents (cement, lime, kiln dust, etc.). A hydraulic excavator will be used to provide the necessary mixing forces and to remove the stabilized waste materials from the tank upon completion. The stabilized materials will then transported and placed in a permanent landfill repository at the site.

We understand the permitted operational procedures at the facility require daily inspection of the secondary containment of the mixing tanks to check for leakage through the primary containment. We also understand that as a matter of practice, USEN will not allow waste materials to be stored in the mixing tanks for extended periods of time (i.e. the materials are treated and removed within a shift period).

1.3 Description of Tanks

The subject mixing tanks are similar in design to the existing mixing pans currently used at the USEN facility. The mixing tanks consist of a steel plate primary containment vessel and an epoxy coated concrete structure that provides secondary containment. The tanks were designed to withstand the static weight of the waste materials in addition to the anticipated dynamic loads from the loading, mixing and unloading activities.

1.3.1 Primary Containment

Structural design of the steel vessel was performed by Samuel Engineering of Greenwood Village, Colorado. The steel vessel consists of the following components, as illustrated on Sheets S101 and S102:

- An external ¾-inch steel wear plate;
- a ½-inch steel structural plate; and
- wide flange (W6x15) structural framing members.

1.3.2 Secondary Containment

Structural design of the secondary containment concrete structure was provided by SECOR of Tualatin, Oregon. The mixing tank secondary containment consists of an epoxy coated, reinforced concrete structure, as illustrated on sheet C204. The concrete mat foundation is 24 inches thick and reinforced with two sets of #6 rebar spaced at 6 inches on-center in both directions, located near the top and bottom of the mat. The 12-inch thick walls are reinforced with a set of #6 vertical rebar at 6 inches on-center and a set of #5 horizontal rebar at 12 inches on-center.

The concrete mixing tank floors include a system of longitudinal drain channels that slope toward a collection box, as illustrated on Sheets C207 and C211. Inspection of the collection box is provided with a 4-inch diameter steel pipe that allows access through the primary steel vessel.

1.4 Compatibility with Waste

The mixing tanks could potentially be exposed to any of the waste streams handled by the USEN facility. Reactive materials and materials with high pH or low pH values represent the greatest potential for incompatibility with the steel tanks. We understand that routine maintenance inspections will be performed to evaluate the condition of the ¾-inch wear plate, and that replacement wear plates will be installed as needed.

The epoxy coating on the concrete structure will inhibit the effects of hazardous materials that may come into contact with the secondary containment.

1.5 Corrosion

The mixing tanks have no external metal components in contact with the soil or water. All reinforcement steel within the concrete secondary containment structures was constructed with the specified 3 inches of cover.

2.0 CONSTRUCTION

2.1 Construction Sequence

Record Steel Construction Inc. (RSCI) of Meridian, Idaho performed construction of the new Stabilization Facility and the subject mixing tanks. Tank construction began with excavation of the subgrade materials. The subgrade materials at the site were prepared and inspected prior to placement of tank foundations, which were observed to consist of Poorly Graded Sand with Silt and Gravel (SP-SM). The subgrade materials were moisture conditioned and compacted to 95 percent of standard proctor (ASTM D 698), in accordance with the construction specifications. Steel reinforcement bars for the tank mat foundations and walls were erected and cast, as shown in the enclosed photos (Appendix B). Structural fill, consisting of the native SP-SM materials, was placed around the exterior of the concrete structure in controlled lifts, moisture conditioned, and compacted to 95% of standard proctor. Multiple epoxy coatings were applied to the interior surfaces of the concrete tanks.

The primary containment steel vessels were fabricated by Rule Steel in Middleton, Idaho. Each tank vessel was fabricated and transported to the site in two halves. The vessels were lowered into position at the site using a 30-ton crane and then joined together along a common seam weld. The integrity of the primary and secondary containment was tested, as described in the following section.

AMERICAN GEO TECHNICS

3.0 CONTAINMENT TESTS

3.1 Secondary Containment Test

The integrity of the secondary containment structures for mixing tank #1 and #2 were tested as described in this section. Each concrete structure was filled with 12 inches of water and inspected after a minimum of 24 hours to record any loss of liquid. The water was exposed to the atmosphere during the test and thus was subject to evaporation. An open-ended control barrel was located on the floor of the concrete tank and monitored to account for the effects of evaporation during the testing periods. The hydrostatic tests performed on the concrete secondary containment structures indicated no net loss of liquid during the test periods.

3.2 Primary Containment Test

The integrity of the steel primary containment vessels for mixing tank #1 and #2 were tested as described in this section. Each steel vessel was filled to capacity with water and monitored for leakage over a 24-hour period. No water was observed to leak into the secondary containment during the test periods.

4.0 CERTIFICATION

"I hereby certify under penalty of law that this document and attached test results were prepared and conducted under my direct supervision. The information submitted, to the best of my knowledge and belief is true, accurate, and complete. The signature and seal provided below is a declaration by the Professional Engineer that, in his professional judgment, the subject mixing tanks were designed, constructed and tested in a manner consistent with the referenced design document and applicable state and federal regulations."

American Geotechnics

Vaughn Thurgood

Vaughn Thurgood, PE

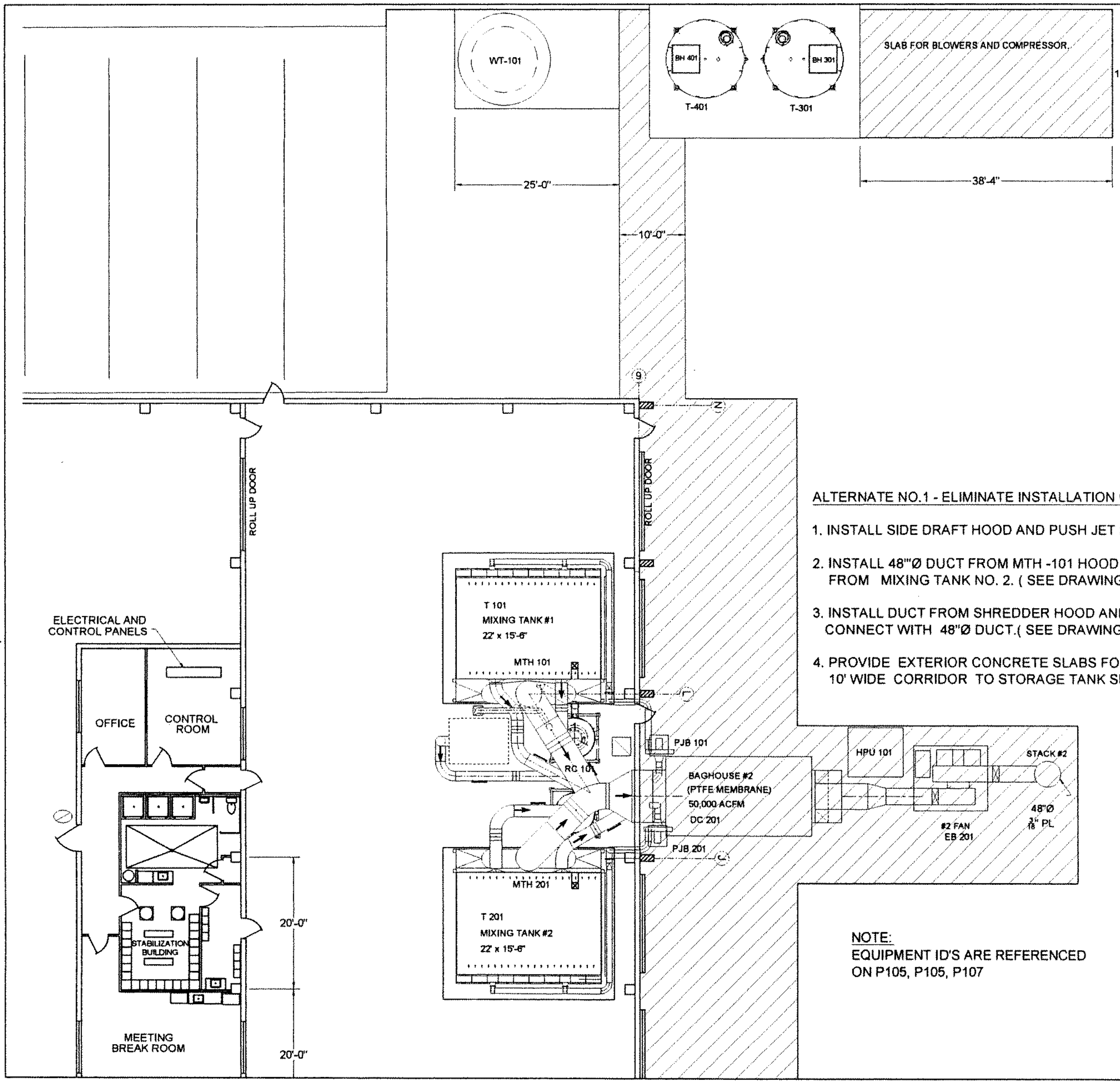
PROFESSIONAL ENGINEER - STATE OF NEVADA
VAUGHN J. THURGOOD
5/4/07
CIVIL
No. 18380

Exp 6-30-10

APPENDIX A

TANK CONSTRUCTION DRAWINGS

M101
S101
S102
C204
C207
C211



ALTERNATE NO.1 - ELIMINATE INSTALLATION OF APC SYSTEM NO. 1

1. INSTALL SIDE DRAFT HOOD AND PUSH JET MANIFOLD AT MIXING TANK NO. 1.
2. INSTALL 48"Ø DUCT FROM MTH -101 HOOD TO CONNECT WITH DUCTWORK FROM MIXING TANK NO. 2. (SEE DRAWING M105 (Alternate No. 1)).
3. INSTALL DUCT FROM SHREDDER HOOD AND VIBRATING CONVEYOR TO CONNECT WITH 48"Ø DUCT.(SEE DRAWING M105 (Alternate No. 1)).
4. PROVIDE EXTERIOR CONCRETE SLABS FOR EQUIPMENT AS SHOWN WITH 10' WIDE CORRIDOR TO STORAGE TANK SLAB.

NOTE:
EQUIPMENT ID'S ARE REFERENCED ON P105, P105, P107

0 16 32
APPROXIMATE SCALE (FEET)

REV	DATE	DESCRIPTION	DSN	CHK	AP
A	9/26/06	ISSUED FOR REVIEW	WBP	JPS	
B	9/29/06	ISSUED FOR REVIEW	WBP	JPS	
0		ISSUED FOR CONSTRUCTION			
1		ISSUED FOR CONSTRUCTION			

PREPARED BY:

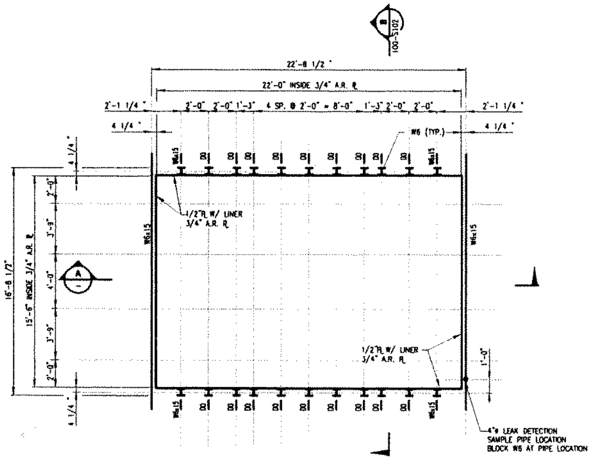
SECOR
7730 SW MOHAWK STREET
TUALATIN, OREGON 97062
PHONE: (503) 691-2030 FAX 692-7074

FOR:
US ECOLOGY
BEATTY, NEVADA

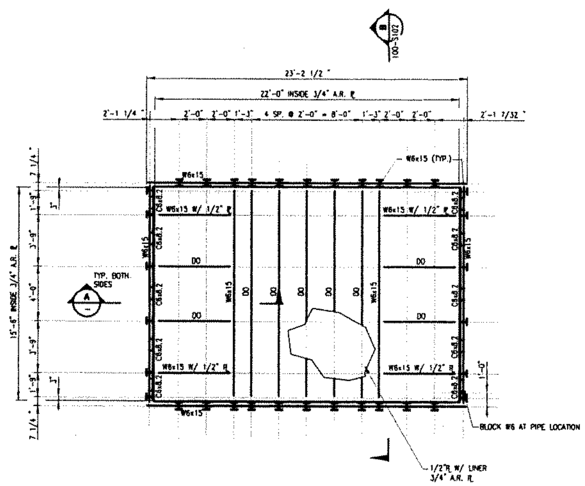
TITLE:
PLAN VIEW - APC SYSTEMS
CONTAINER MANAGEMENT/
STABILIZATION BUILDING

DRAWN BY: S. S., B.F., W.P.	DESIGNED BY: WI
CHECKED BY: JPS	APPROVED BY:
PROJECT NUMBER: 930T.05341.00.0007	SCALE: AS SHOWI
DATE: 09/26/2006	FILE PATH:

FIGURE:
M101(Alternate No. 1)



FRAMING PLAN @ TOP
SCALE: 1/4"=1'-0"



FRAMING PLAN @ BOTTOM
SCALE: 1/4"=1'-0"

STRUCTURAL STEEL GENERAL NOTES:

1.0 CODES AND STANDARDS

1.1 STRUCTURAL STEEL SHALL BE DESIGNED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE 9TH EDITION OF THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN), THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES.

1.2 MATERIALS SHALL CONFORM TO ASTM STANDARD SPECIFICATIONS

WIDE FLANGE AND STRUCTURAL TEE SHAPES, BARS, AND PLATE	A992, 50ksi
OTHER STRUCTURAL SHAPES	A36
HIGH STRENGTH BOLTS	A325 TYPE 1
HEAVY HEX NUTS	A563 GRADE DH
HARDENED STEEL WASHERS	F436
DTI WASHERS	F959
COMMON BOLTS	A307 GRADE B
STRUCTURAL TUBING	A 500 GRADE B
PIPE	A53 GRADE B
STEEL GRATING	A1011

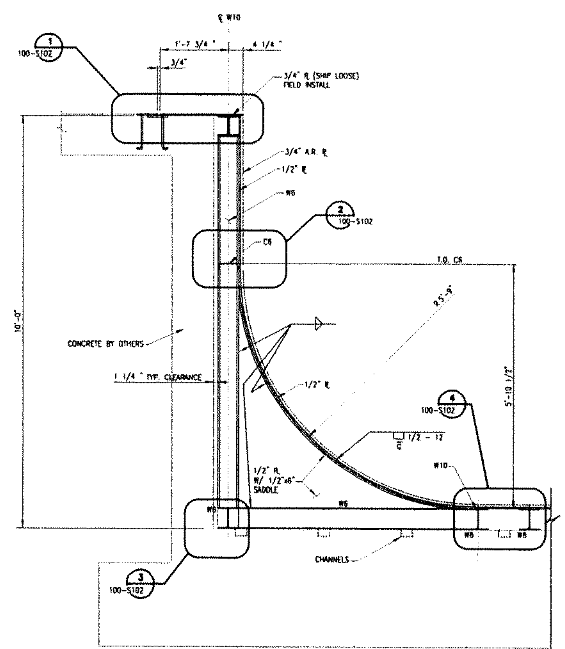
1.3 STEEL WORK SHALL BE INSPECTED BY A SPECIAL INSPECTOR IN ACCORDANCE WITH CHAPTER 17 OF THE UNIFORM BUILDING CODE. INSPECTION SHALL INCLUDE STRUCTURAL WELDING, WELDING OF REINFORCEMENT; HIGH STRENGTH BOLTING, AND WORK PERFORMED BY NON-APPROVED FABRICATORS.

2.0 WELDED CONNECTIONS

2.1 WELDED FIELD CONNECTIONS SHALL BE USED ONLY WHERE SPECIFIED ON DESIGN DRAWINGS. ALL WELDING SHALL CONFORM TO AWS D1.1

2.2 WELDING ELECTRODES SHALL HAVE A 70 KSI MINIMUM TENSILE STRENGTH.

NOTE: TANK TO BE SHIPPED IN TWO SECTIONS. JOINT LOCATION TO BE DETERMINED BY THE FABRICATOR. FIELD WELD USING MINIMUM FILLET WELD PER THE PLATE THICKNESS. 1



SECTION A
3/4"=1'-0"

REFERENCE DRAWINGS	
DWG NO.	DESCRIPTION
100-S102	MIXING TANKS FRAMING PLANS SECTIONS AND DETAILS SHEET 2 OF 2

REVISIONS

CLIENT	PROJECT MANAGER	PROJECT ENGINEER	CHECK	NO.	DESCRIPTION	DATE	BY
	DB		DB	2	CHANGED TITLE	8/14/08	BF
	DB		DB	1	ADDED NOTE	7/19/08	BF
	DB		DB	0	ISSUED FOR CONSTRUCTION	7/11/08	BF

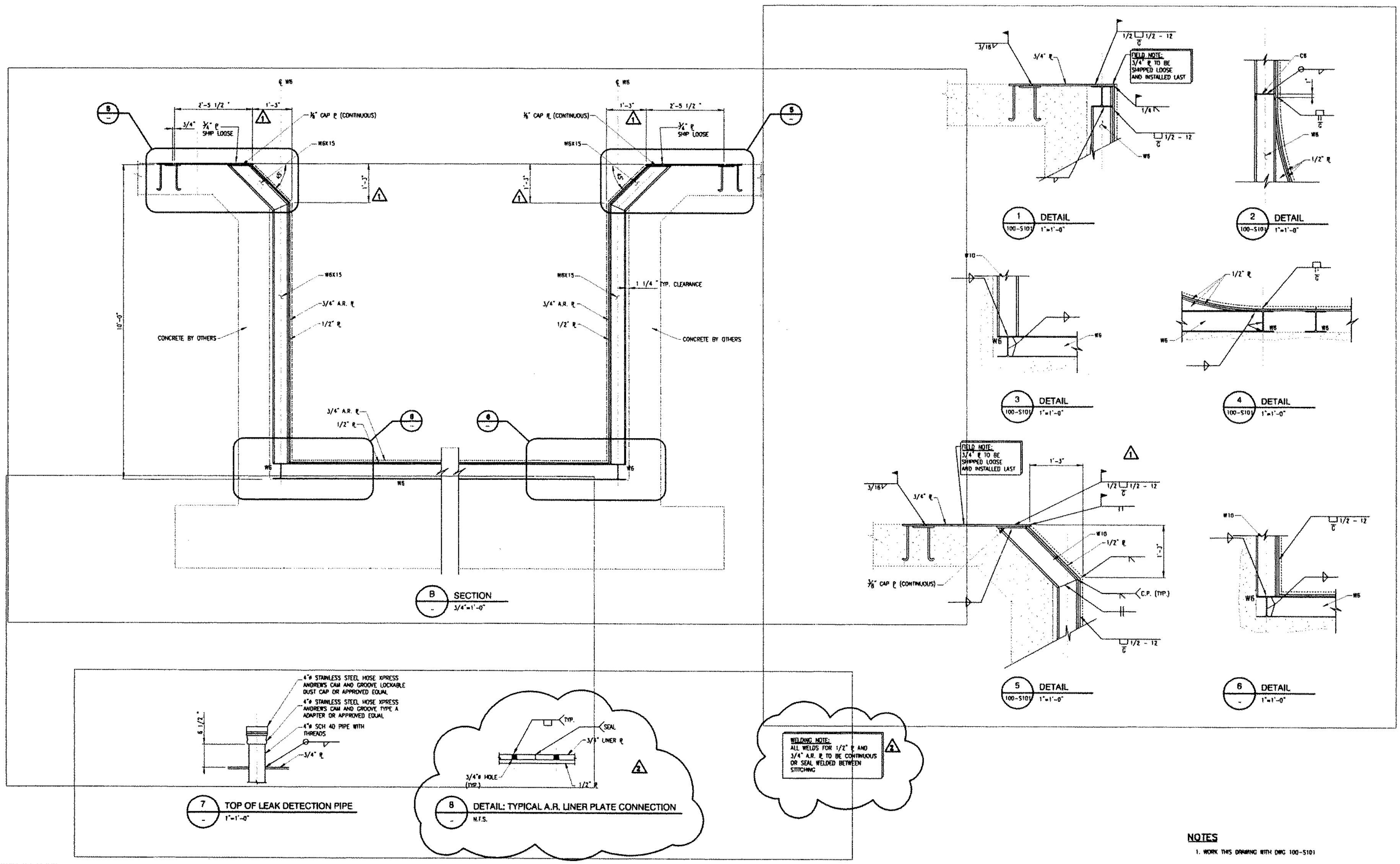
DEPARTMENT:	STRUCTURAL STEEL	
SCALE:	AS NOTED	DATE
DESIGNED:	D. BACON	3/16/06
DRAWN:	B. FITZGERALD	3/16/06
CHECKED:	D. BACON	7/11/06
APPROVED:	D. BACON	7/11/06

CLIENT: US ECOLOGY
HWY 95 12 MI SOUTH
BEATTY, NEVADA

Samuel Engineering, Inc.
We Provide Solutions
8450 E. CRESCENT PARKWAY
GREENWOOD VILLAGE, CO 80111
Phone: 303.714.4840
Fax: 303.714.4800

TITLE
CONTAINER MANAGEMENT/ STABILIZATION BUILDING
MIXING TANKS
FRAMING PLANS SECTIONS AND DETAILS
SHEET 1 OF 2 2

PROJECT NO. 6010-01
DRAWING NUMBER S101
REV. 2



NOTES

1. WORK THIS DRAWING WITH DWG 100-S101

DWG NO.	DESCRIPTION
100-S101	MIXING TANKS FRAMING PLANS SECTIONS AND DETAILS SHEET 1 OF 2

REFERENCE DRAWINGS

CLIENT	PROJECT MANAGER	PROJECT ENGINEER	CHECK	NO.	DESCRIPTION	DATE	BY
DB		DB		2	ADDED NOTE CHANGED TITLE AND DETAIL	8/14/08	BF
DB		DB		1	REVISED DIMENSION	7/19/06	BF
DB		DB		0	ISSUED FOR CONSTRUCTION	7/11/06	BF

REVISIONS

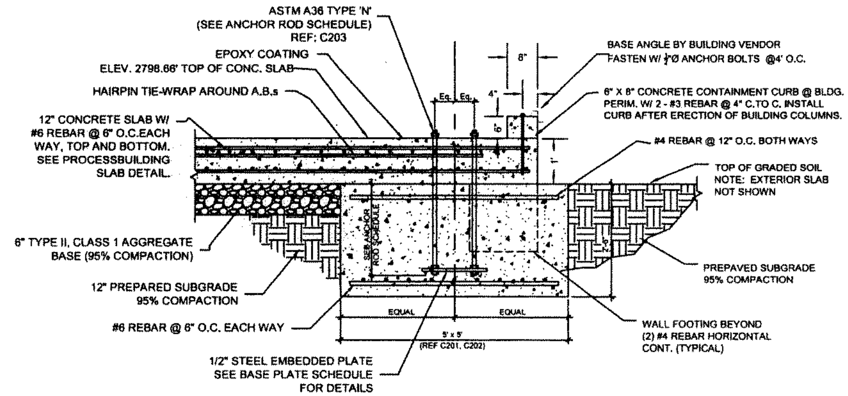
DEPARTMENT	STRUCTURAL STEEL	
SCALE	AS NOTED	DATE
DESIGNED	D. BACON	3/16/06
DRAWN	B. FITZGERALD	3/16/06
CHECKED	D. BACON	7/11/06
APPROVED	D. BACON	7/11/06

CLIENT: US ECOLOGY HWY 95 12 MI SOUTH BEATTY, NEVADA

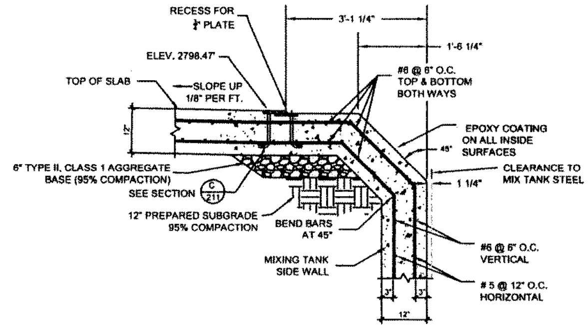
Samuel Engineering, Inc.
We Provide Solutions
8450 E. CRESCENT PARKWAY GREENWOOD VILLAGE, CO 80111
Phone: 303.714.4840 Fax: 303.714.4800

TITLE
CONTAINER MANAGEMENT/ STABILIZATION BUILDING
MIXING TANKS
FRAMING PLANS SECTIONS AND DETAILS
SHEET 2

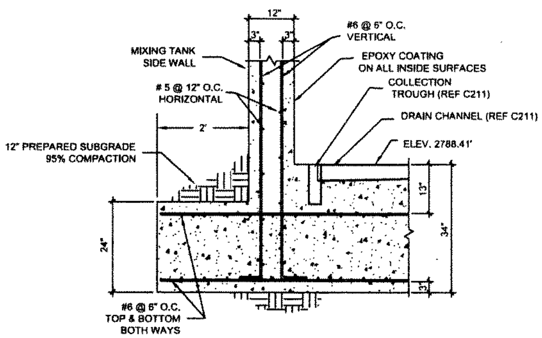
PROJECT NO. 6010-01
DRAWING NUMBER S102
REV. 2



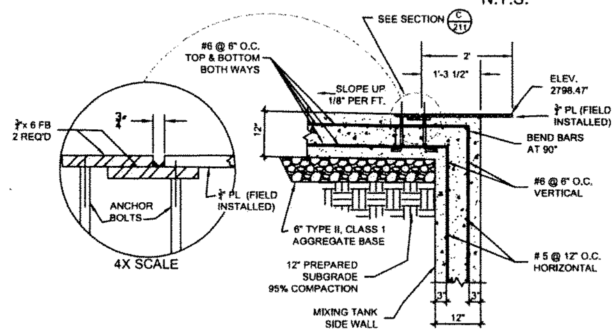
A / C204 TYPICAL COLUMN FOOTING
N.T.S.



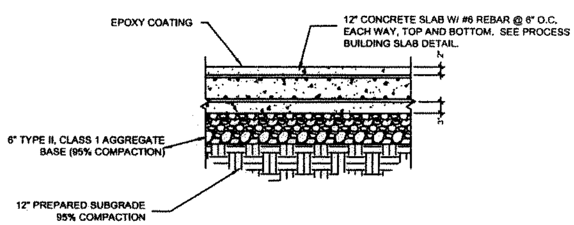
1 / C204 MIXING TANK TOP CORNER REINFORCING STEEL DETAIL
N.T.S.



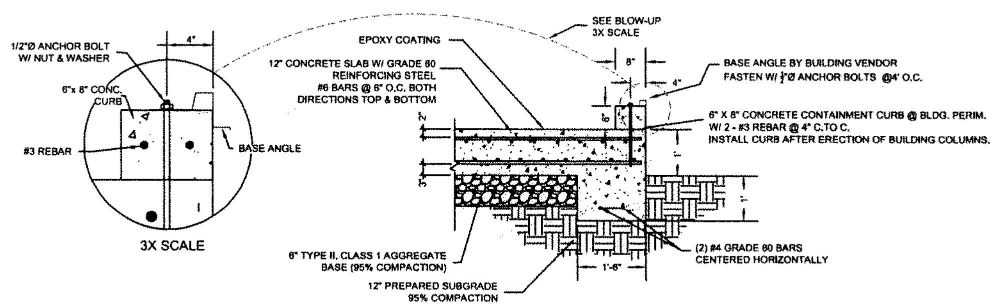
2 / C204 MIXING TANK BOTTOM DETAIL
N.T.S.



3 / C204 MIXING TANK TOP CORNER REINFORCING STEEL DETAIL
N.T.S.



4 / C204 PROCESS BUILDING SLAB DETAIL
N.T.S.



5 / C204 TYPICAL PERIMETER FOOTING
N.T.S.

NOTES:
1. All reinforcing steel on this project will be grade 60.
2. All concrete on the project will have a 28-day compressive strength of 4,000 psi.
3. Compact subgrade to 95% of ASTM D698

SCALE : 3/4" = 1' ON 24x36 D SIZE
SCALE : 3/8" = 1' ON 11x17 B SIZE

REV	DATE	DESCRIPTION	DSN	CHK	APP
A	07/21/06	ISSUED FOR REVIEW	WBP	JPS	
B	8/16/06	ISSUED FOR REVIEW	WBP	JPS	
0	9/11/06	ISSUED FOR BID	WBP	JPS	
1		ISSUED FOR CONSTRUCTION			

PREPARED BY:

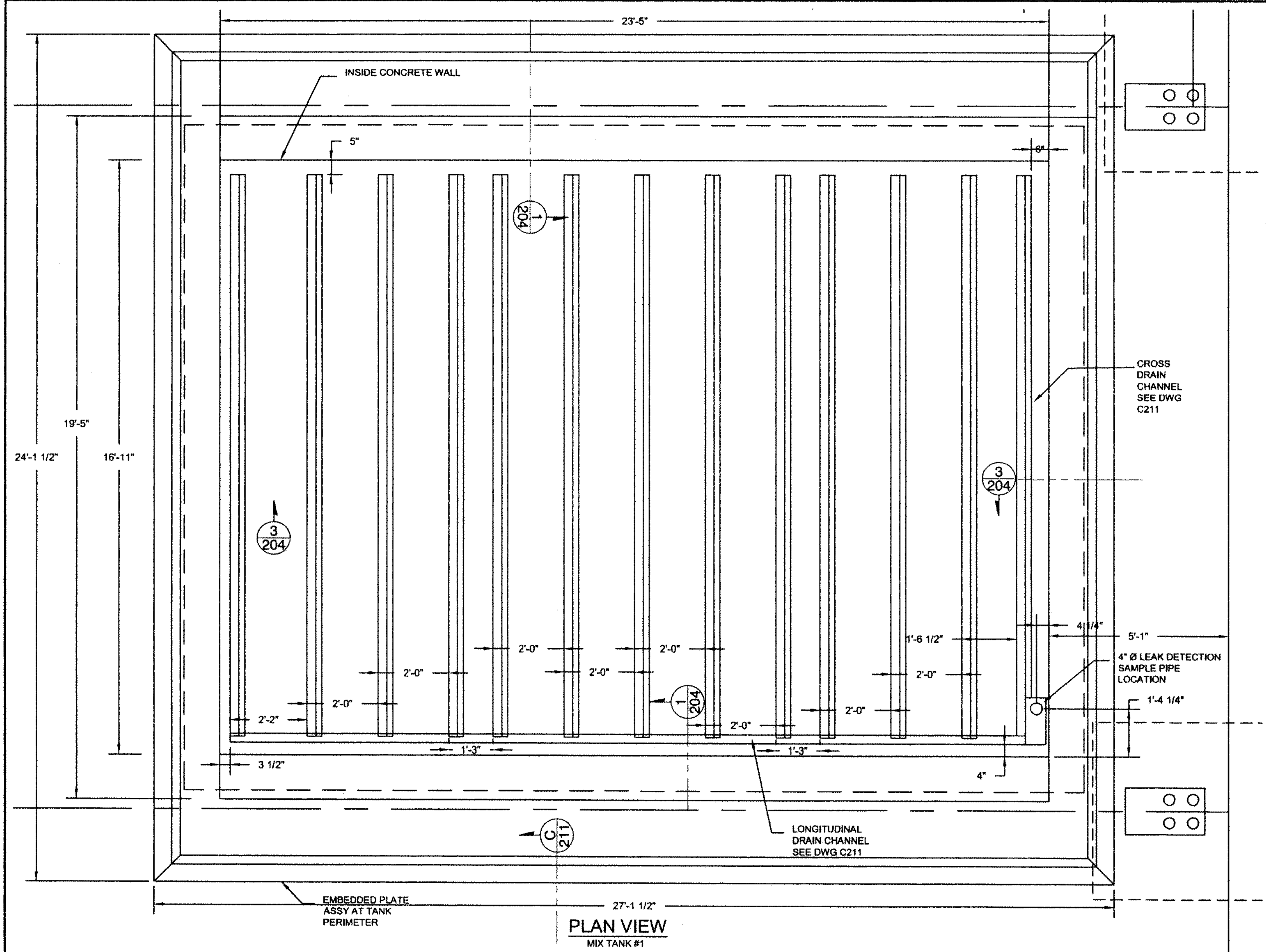
SECOR
7730 SW MOHAWK STREET
TUALATIN, OREGON 97062
PHONE: (503) 691-2030 FAX: 692-7074

FOR:
US ECOLOGY
BEATTY, NEVADA

TITLE: SLAB, COLUMN FOOTING AND MIXING TANK DETAILS CONTAINER MANAGEMENT/ STABILIZATION BUILDING

DRAWN BY: S. S., B.F., W.P., KAM	DESIGNED BY: WP
CHECKED BY: JPS	APPROVED BY:
PROJECT NUMBER: 930T.05341.00.0007	SCALE: AS SHOWN
DATE: 09/11/2006	FILE PATH:

FIGURE: C204



PLAN VIEW
MIX TANK #1

1.) DRAIN CHANNELS TO BE WELDED TOGETHER IN THE FIELD (AND ATTACHED TO REBAR) TO FORM LEVEL AND TRUE SCREED SURFACE FOR CEMENT FINISHING.

2.) PRIOR TO PLACING CONCRETE FILL CHANNELS WITH FOAM OR OTHER TEMPORARY MATERIAL TO PREVENT FILLING CHANNELS WITH CONCRETE.

SCALE : 3/4" = 1' ON 24X36 D SIZE
SCALE : 3/8" = 1' ON 11X17 B SIZE.

REV	DATE	DESCRIPTION	DSN	CHK	APP
A	07/21/06	ISSUED FOR REVIEW	WBP	JPS	
B	8/16/06	ISSUED FOR REVIEW	WBP	JPS	
0	9/11/06	ISSUED FOR BID	WBP	JPS	
1		ISSUED FOR CONSTRUCTION			

PREPARED BY:

SECOR
7730 SW MOHAWK STREET
TUALATIN, OREGON
PHONE: (503) 691-2030/692-7074 (FAX)

FOR:

US ECOLOGY
BEATTY, NEVADA

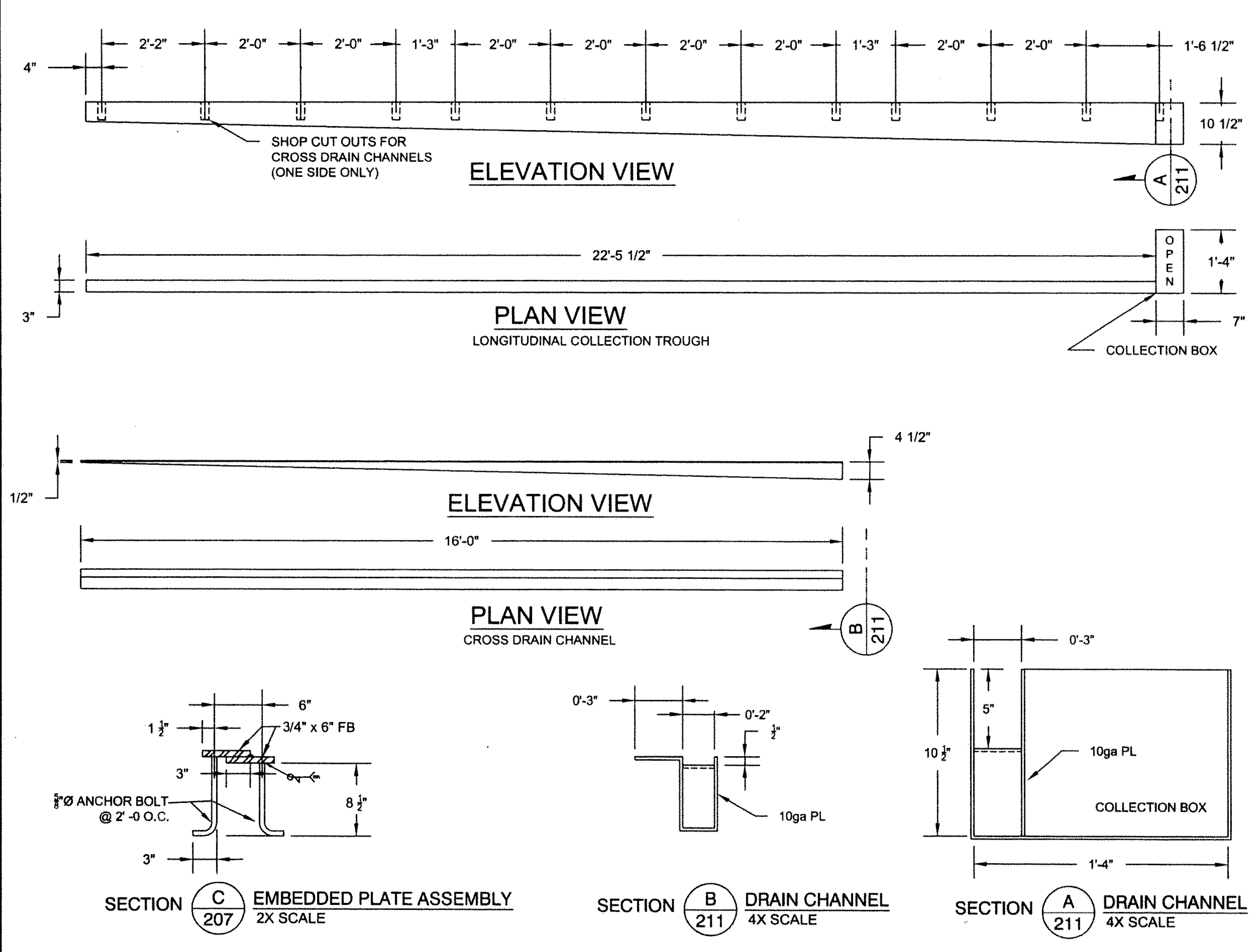
TITLE:

MIXING TANK SLAB
STABILIZATION/CONTAINER
MANAGEMENT BUILDING

DRAWN BY: S. S., B.F., W.P., KAM	DESIGNED BY: WP
CHECKED BY: JPS	APPROVED BY:
PROJECT NUMBER: 930T.05341.00.0007	SCALE: AS SHOWN
DATE: 09/11/2006	FILE PATH:

FIGURE:

C207



SCALE : 3/16" = 1' ON 24X36 D SIZE
SCALE: 3/32" = 1' ON 11X17 B SIZE.

REV	DATE	DESCRIPTION	DSN	CHK	APP
A	07/21/06	ISSUED FOR REVIEW	WBP	JPS	
B	8/16/06	ISSUED FOR REVIEW	WBP	JPS	
0	9/11/06	ISSUED FOR BID	WBP	JPS	
1		ISSUED FOR CONSTRUCTION			

PREPARED BY:

SECOR
7730 SW MOHAWK STREET
TUALATIN, OREGON
PHONE: (503) 691-2030/692-7074 (FAX)

FOR:
US ECOLOGY
BEATTY, NEVADA

TITLE:
MIXING TANK SLAB
DRAIN CHANNELS
MANAGEMENT BUILDING

DRAWN BY: S. S., B.F., W.P., KAM	DESIGNED BY: WP
CHECKED BY: JPS	APPROVED BY:
PROJECT NUMBER: 930T.05341.00.0007	SCALE: AS SHOWN
DATE: 09/11/2006	FILE PATH:

FIGURE:
C211

APPENDIX B

TANK CONSTRUCTION PHOTOS

Photo – 1 The sand and gravel subgrade materials are moisture conditioned and compacted following excavation.

Photo – 2 Survey control for the foundation of mixing tank #1 is established while excavation continues for mixing tank #2.

Photo – 3 View of the #6 rebar installation prior to pouring the tank mat foundations.

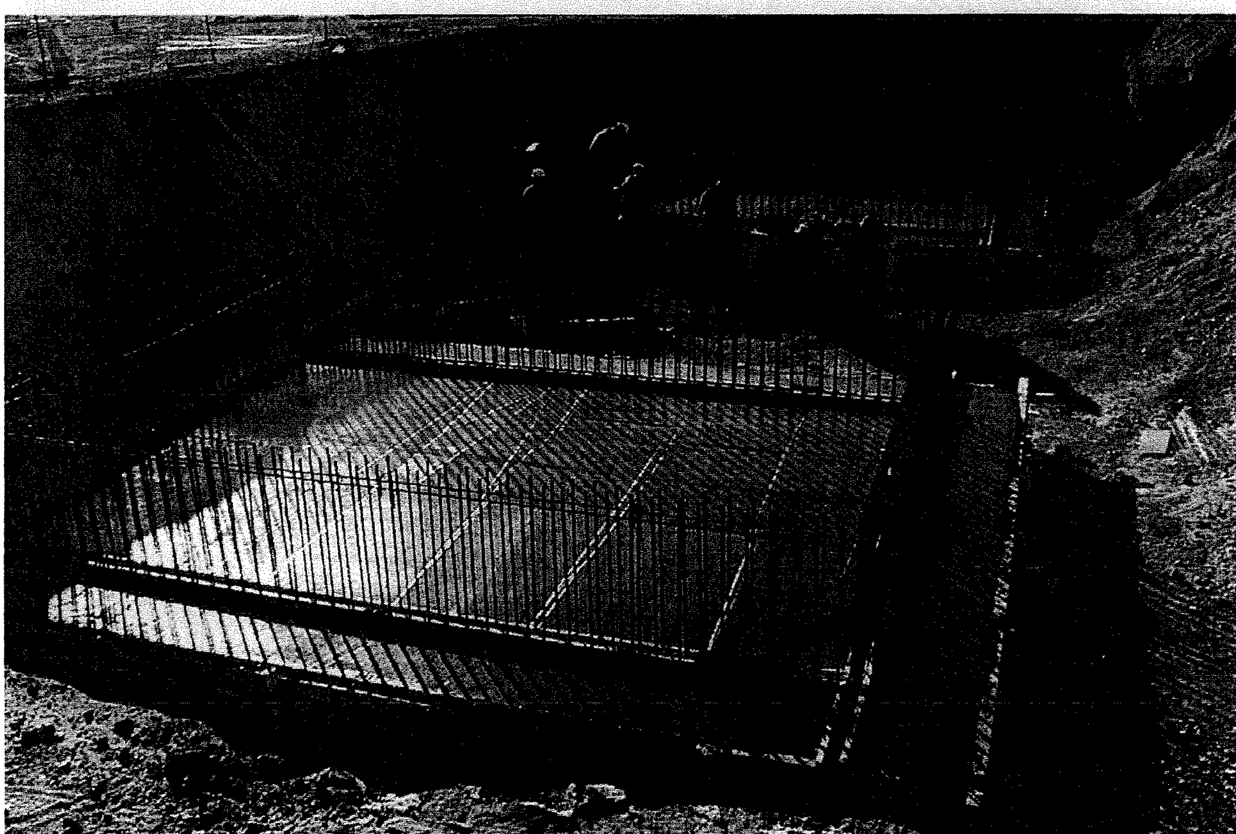


Photo – 4 View of the freshly poured tank foundations.

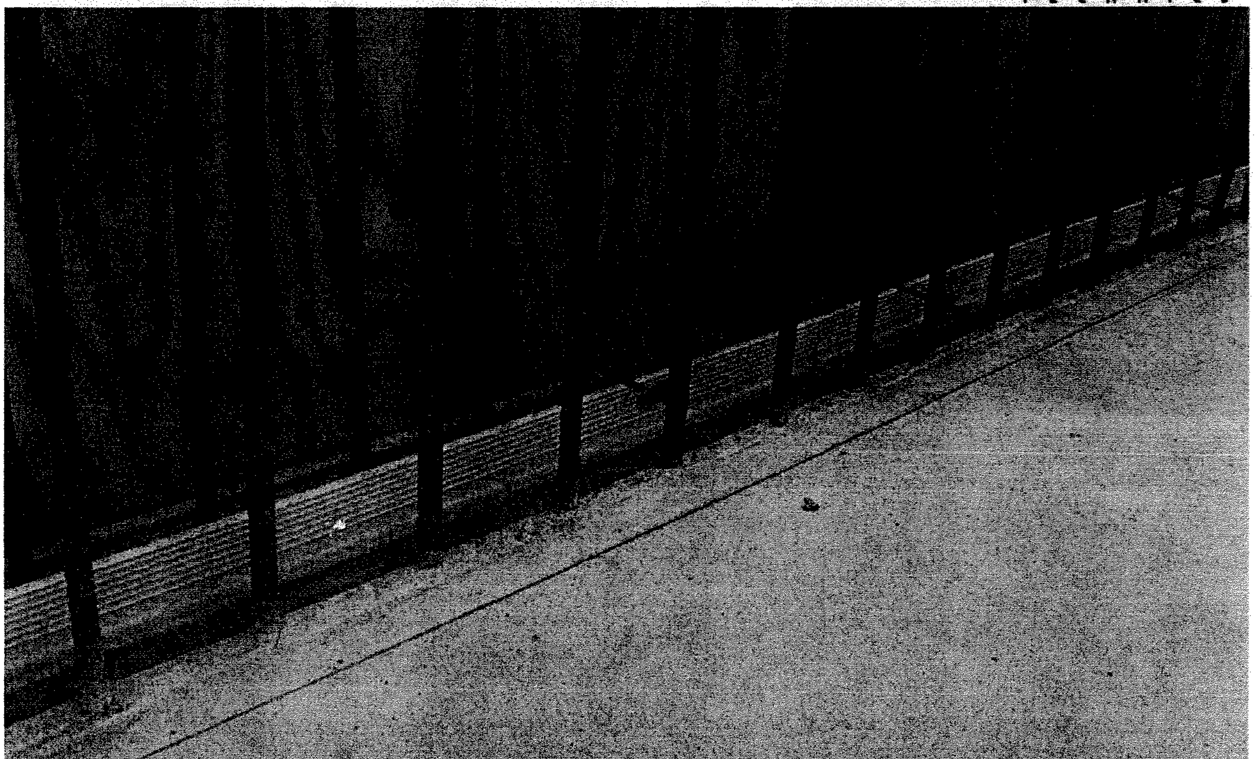


Photo – 5 View of a water stop installed along the construction joint located between the walls and the foundation of the tanks.

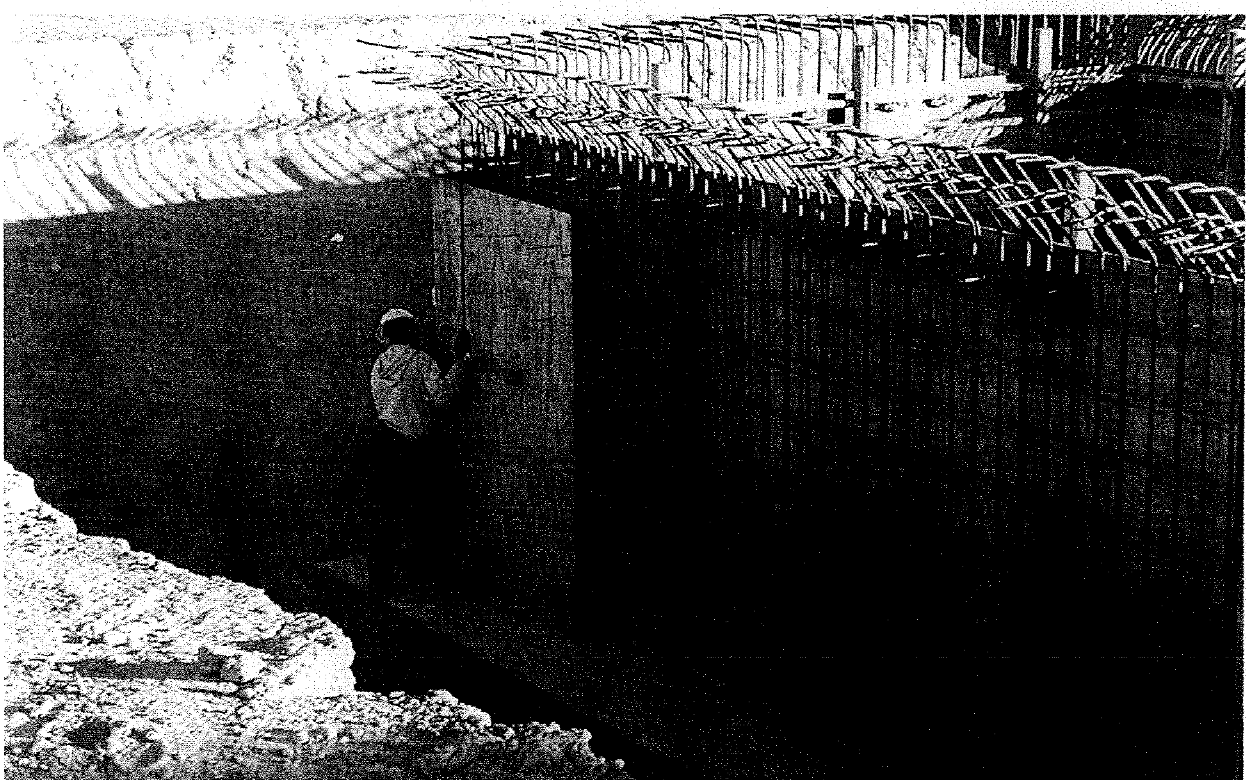


Photo – 6 Typical view of the vertical and horizontal reinforcement in the walls of the tanks.

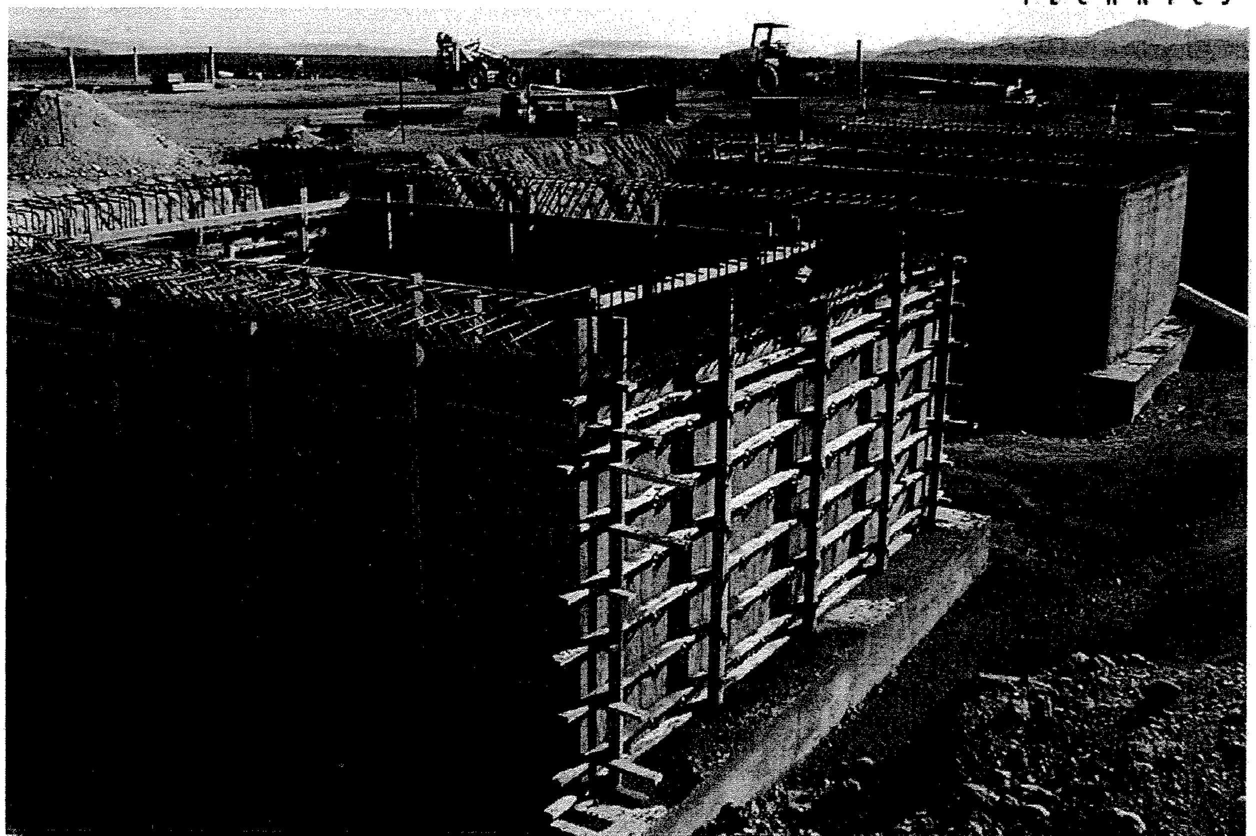


Photo – 7 View of the completed formwork and concrete placement.

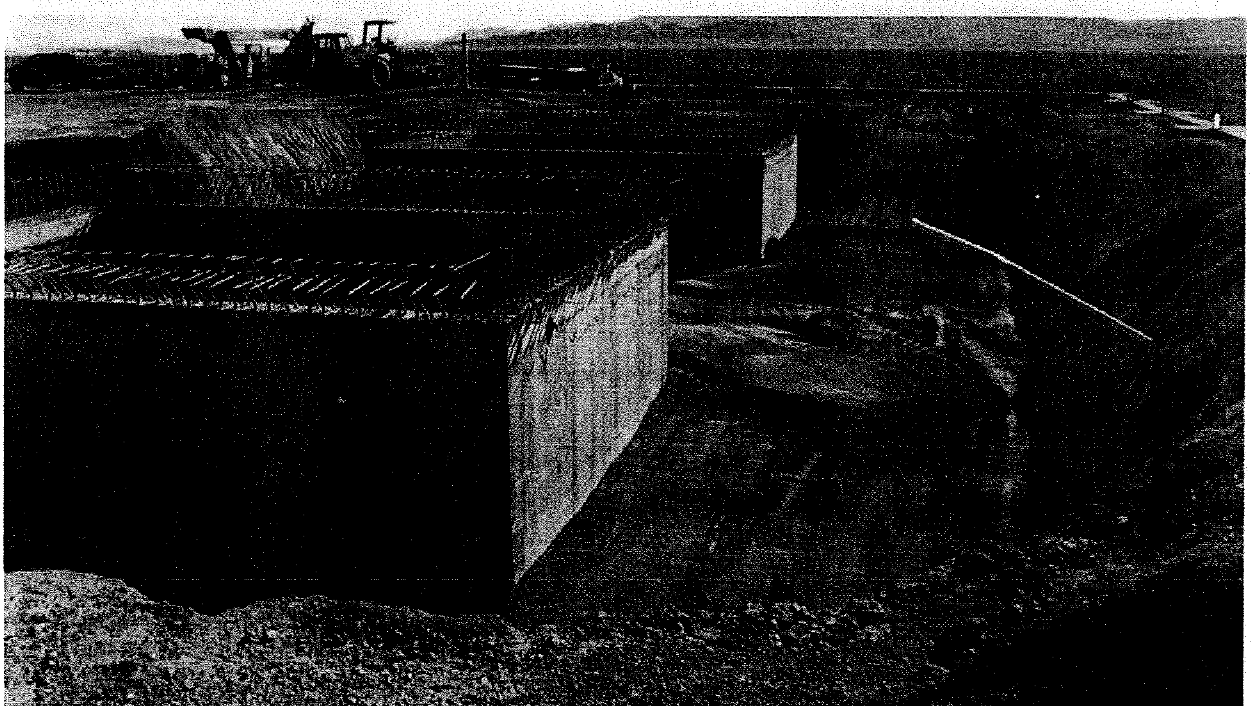


Photo – 8 Structural fill is place around the exterior perimeter of the concrete tanks in uniform lifts and compacted.

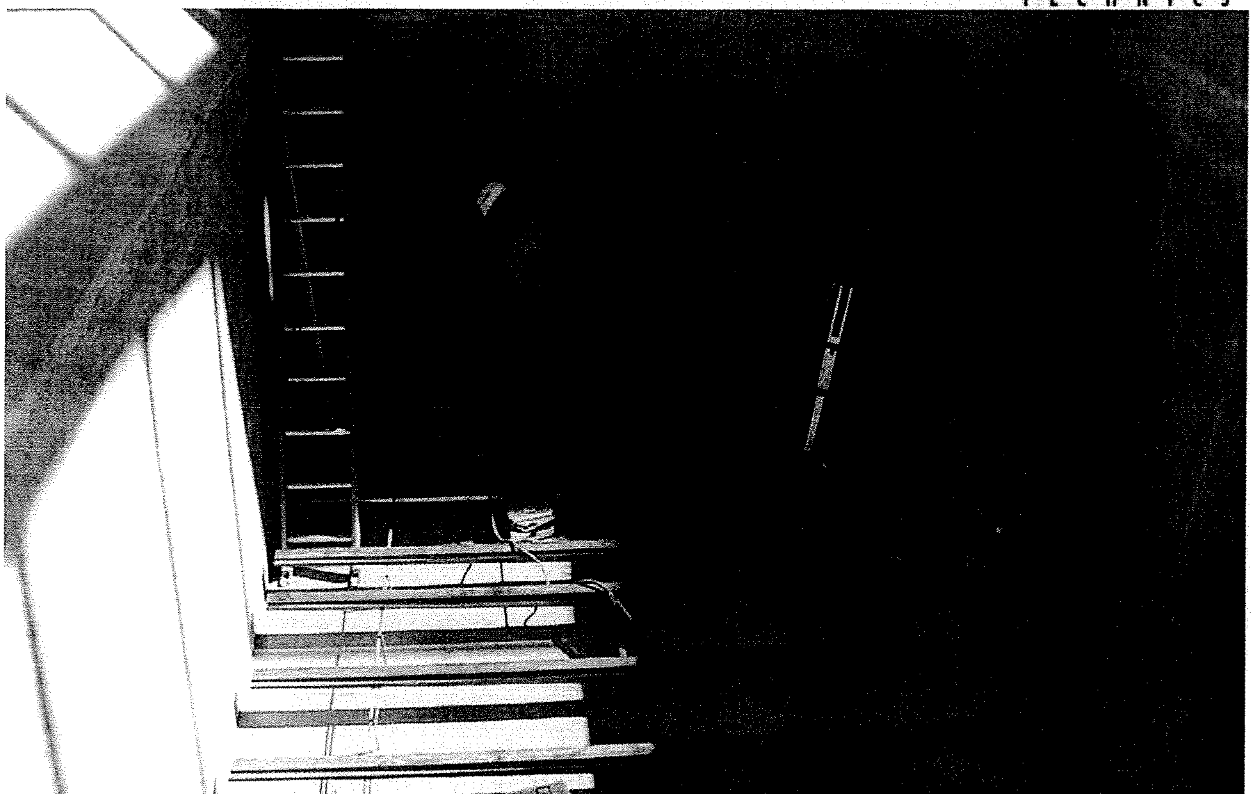


Photo – 9 Drain channels are welded into place prior to pouring the floor of the concrete tank.

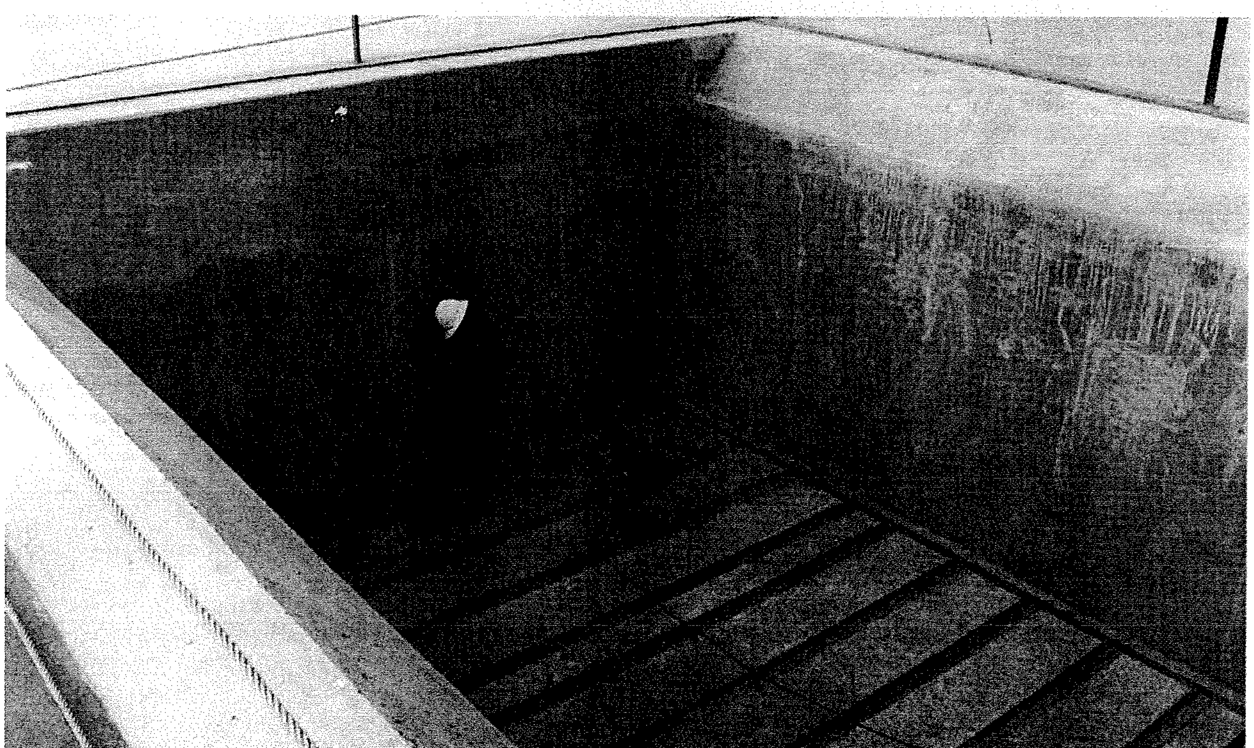


Photo – 10 Concrete surfaces were sand blasted and cleaned in preparation for the epoxy coating.

Photo – 11 Primer coat of epoxy is applied to the prepared concrete floor and walls.

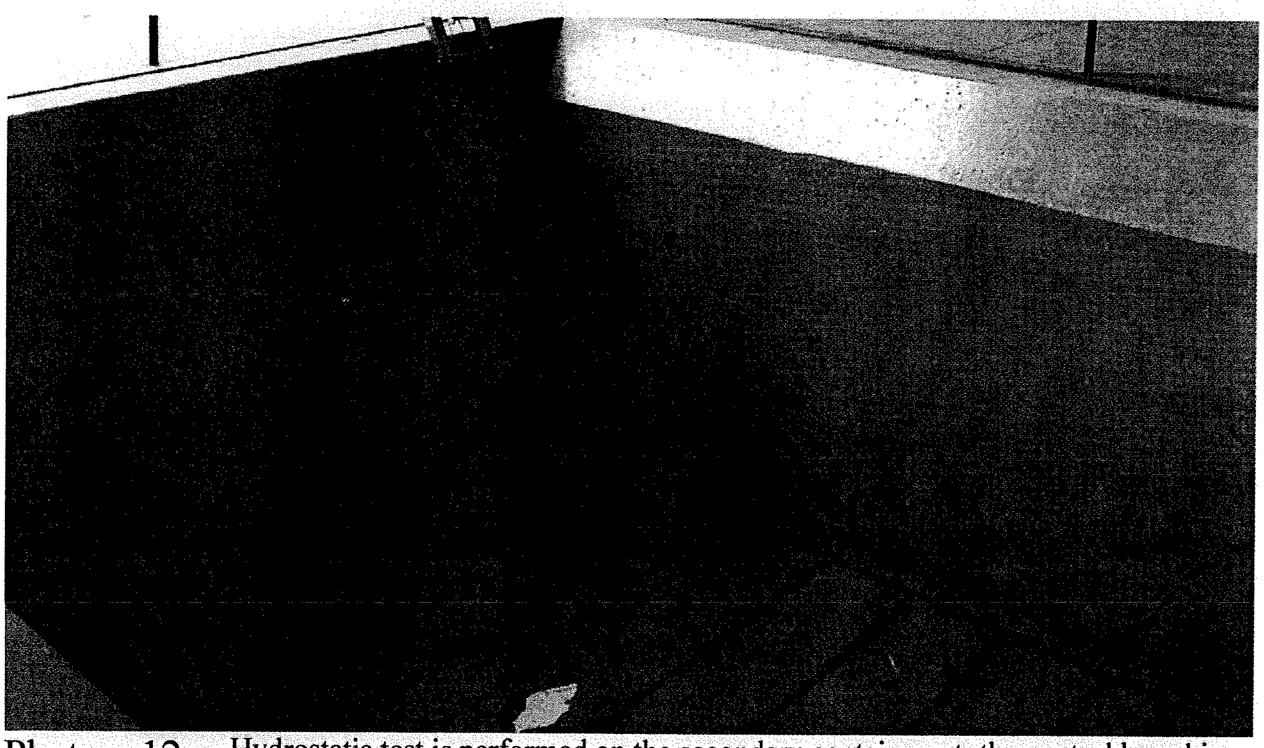


Photo – 12 Hydrostatic test is performed on the secondary containment; the control barrel is visible near the base of the ladder.

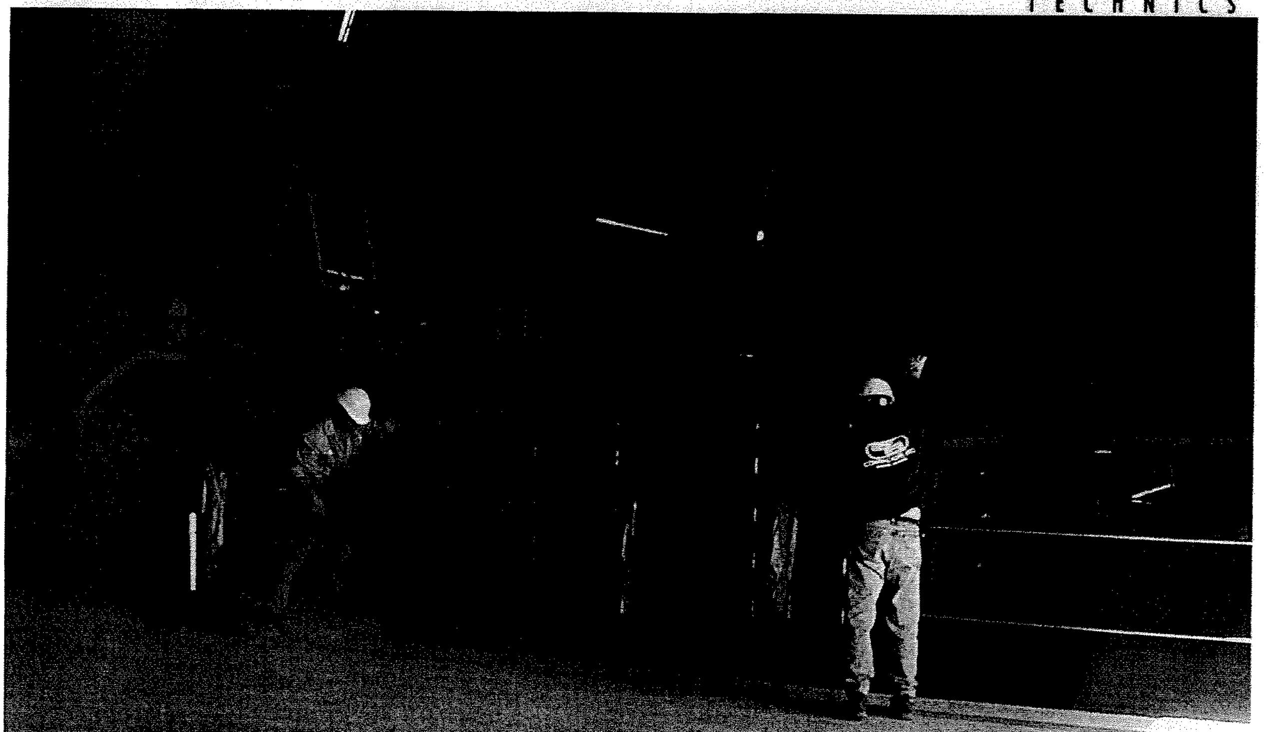


Photo – 13 The steel vessels were constructed off-site in two halves and then transported to the site and lowered into position.

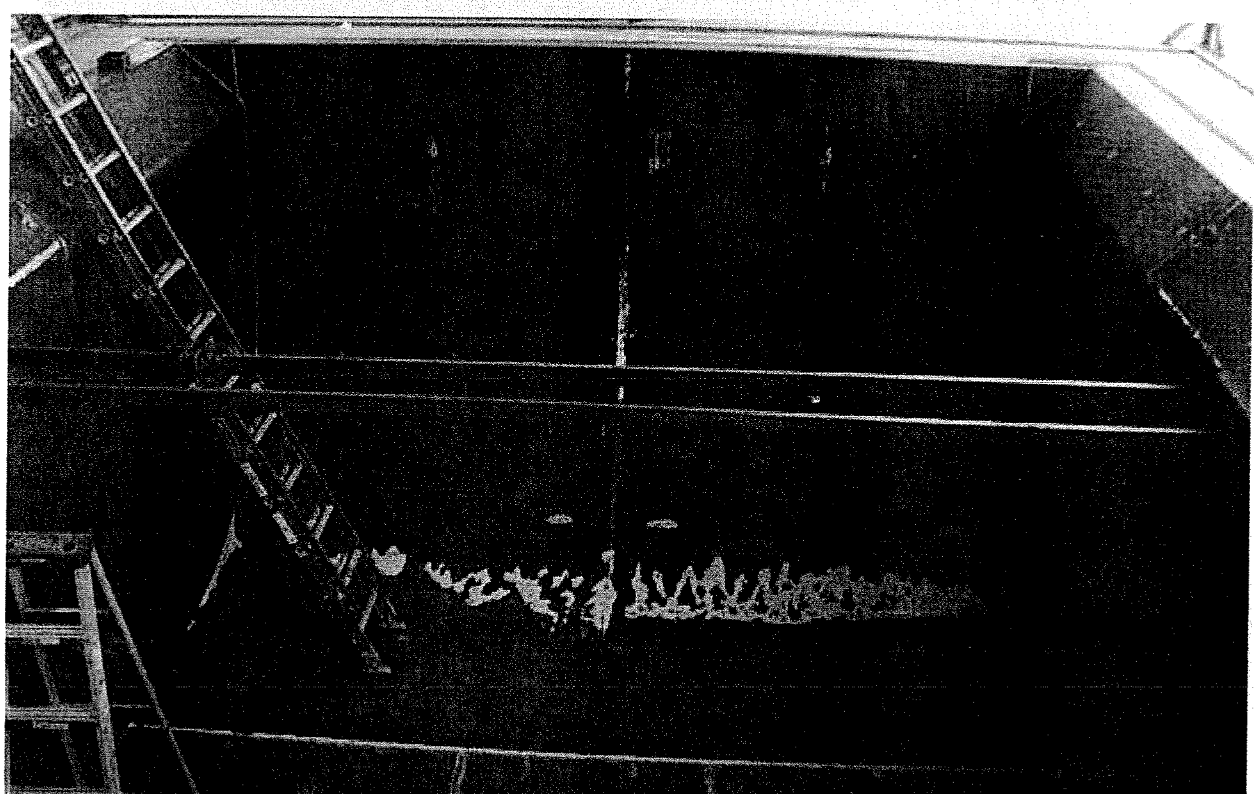


Photo – 14 View of the steel vessel after placement of both halves into the mixing tank.

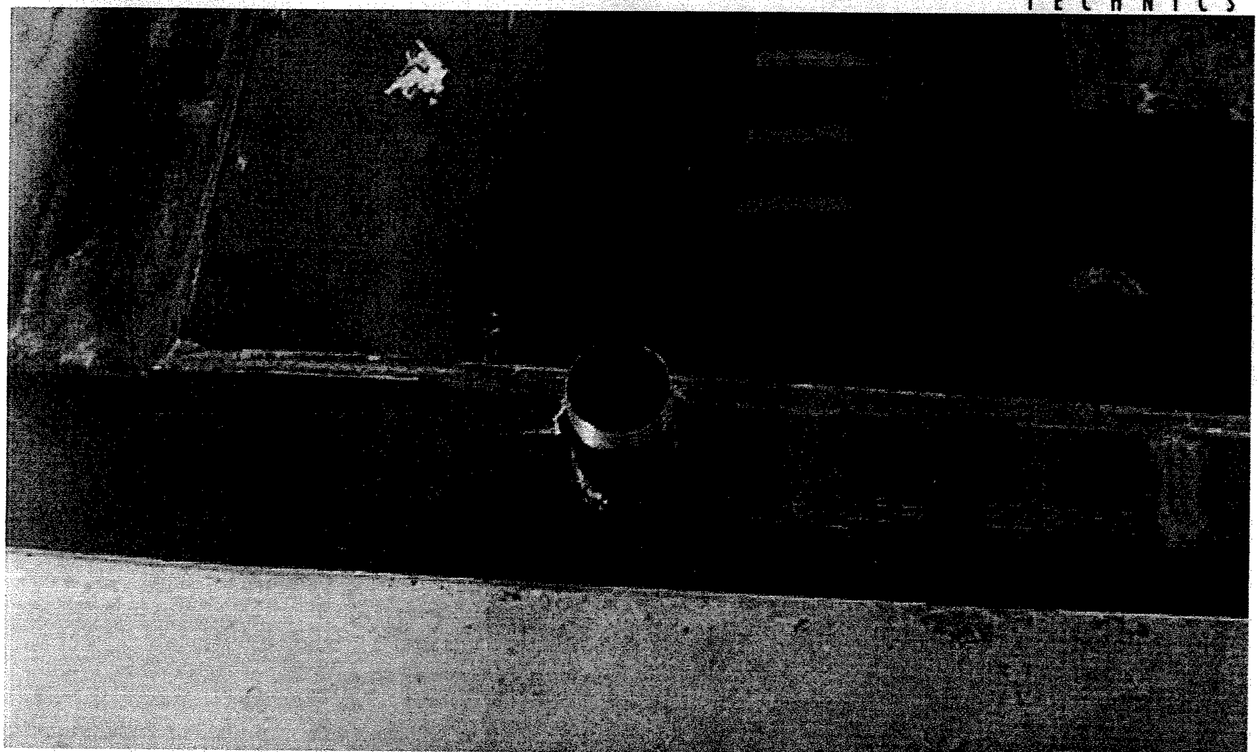


Photo – 15 View of the 4-inch diameter access port that allows inspection of the secondary containment. Note the perimeter plates are not yet installed.

Photo – 16 The two halves of the steel vessel are joined along a common seam with multiple passes of welding rod.

Photo – 17 The steel mixing tanks were filled with water to test the integrity of the primary containment.

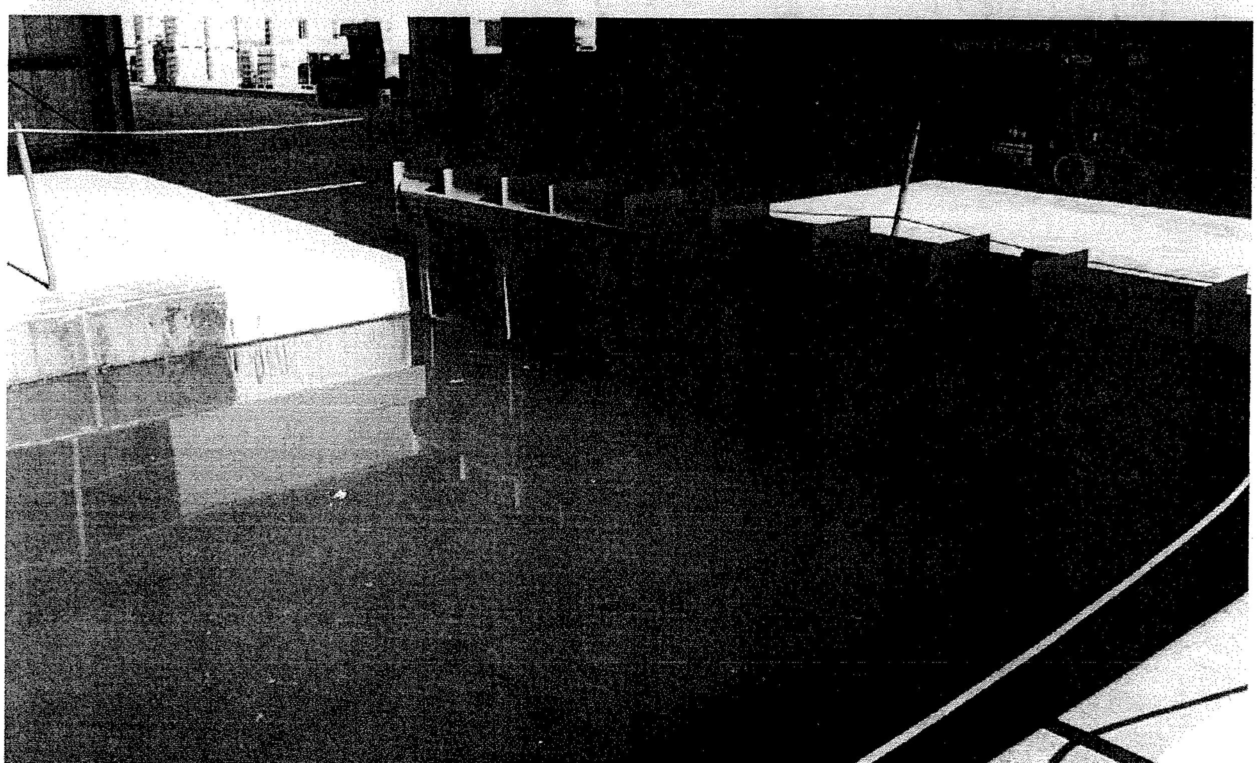


Photo – 18 No leakage was observed into the secondary containment during the test period. A push jet manifold is visible on the far edge of the mixing tank.

APPENDIX C

HYDROSTATIC TEST REPORTS

US Ecology
P.O. Box 578
Beatty, Nevada 89003

800/239-3943
775/553-2203
Fax: 775/553-2742
www.americanecology.com

USEcology
an American Ecology company

March 23, 2007

Mr. Vaughn Thurgood, P.E.
American Geotechnics
5260 Chinden Blvd.
Boise, ID 83714

RE: US Ecology Nevada, Inc. - **Stabilization Building Treatment Tank Containment Leak Testing**

Mr. Thurgood;

This letter presents the results of the hydrostatic leak tests performed on the Stabilization Treatment Pan Secondary Containment Vaults located within the new Stabilization Building. The following test procedure was followed, as directed in your previous communications.

- The containment structures were cleaned and dried and allowed to stand for 24 hours.
- A second application of epoxy was installed and a 24 hour cure time was allowed.
- About 12 inches of water was placed in each of the containment structures.
- A thirteen inch tall drum (control drum) of known integrity was placed on the floor of the containment and filled to a level slightly above that of the water in the containment.
- Upon initialization of each test the water depth measurements were recorded from specific locations in the containment and control drum (See tables).
- Water levels were also measured after a 24 hour period or, in the case of the North Pan on March 21, when weather conditions permitted.

Date/Time	North Pan	Control Drum
3/19/07 16:30	12.0"	11 3/16"
3/20/07 16:30	-- *	11"
3/21/07 07:30	11 11/16"	10 7/8"
Delta @ 36 hours	5/16"	5/16"

Date/Time	South Pan	Control Drum
3/22/07 16:30	11 3/4"	11 5/8"
3/23/07 16:30	11 5/8"	11 1/2"
Delta @ 24 hours	1/8"	1/8"

* Windy conditions inhibited accurate measurement.

Should you have questions regarding this information, please contact either myself (extension 104) or Mr. Mark John (extension 103) at 800-239-3943.

Sincerely,

R L Marchand

Robert Marchand
General Manager

Enclosure
cc: Mr. Mark John, Operations Manager - US Ecology Nevada

07-008

Recycled Paper

US Ecology
P.O. Box 578
Beatty, Nevada 89003

800/239-3943
775/553-2203
Fax: 775/553-2742
www.americanecology.com

USEcology
an American Ecology company

May 4, 2007

Mr. Vaughn Thurgood, P.E.
American Geotechnics
5260 Chinden Blvd.
Boise, ID 83714

RE: **Stabilization Building Treatment Tank**
Steel Vessel Primary Containment Leak Testing
US Ecology Nevada, Inc.

Mr. Thurgood;

This letter presents the results of the hydrostatic leak tests performed on the primary containment steel vessels associated with the treatment tanks located within the new Stabilization Building. The following test procedure was followed, as directed in your previous communications.

- Each treatment tank was filled to capacity with clean water.
- While the steel tanks were being filled with water, we noted that water spilled on the building floor was running into the void space between the top of the primary tank liner and the secondary containment. This gap will be closed when the epoxy coatings are applied to the building floor, fully isolating the building floor surface and the primary tank liner from the secondary containment. Upon initialization of each test, the depth of water within the secondary containment sump was observed and recorded.
- Water levels in each secondary containment sump were measured after a 24 hour period as follows.

Date/Time	North Pan Secondary Containment
4/30/07 14:00	5 1/8 "
5/1/07 14:00	5 1/8 "
Delta @ 24 hours	0"

Date/Time	South Pan Secondary Containment
5/3/07 08:00	2 7/8"
5/4/07 08:00	2 7/8"
Delta @ 24 hours	0"

Should you have questions regarding this information, please contact either myself (extension 104) or Mr. Mark John (extension 103) at 800-239-3943.

Sincerely,

R L Marchand

Robert Marchand
General Manager

Enclosure
cc: Mr. Mark John, Operations Manager - US Ecology Nevada

07-008

Recycled Paper